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Five-Year Review Report

First Five-Year Review Report

for

Gentile Air Force Station

The Defense Electronics Supply Center, Dayton

Kettering, Ohio

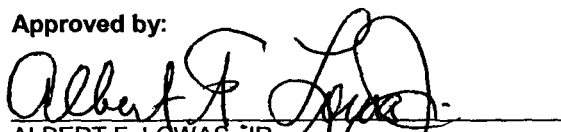
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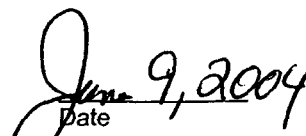

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Meeting, Gentile Air Force Station, Kettering, OH

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- 1 List of Documents Reviewed
- 2 Public Notice - CERCLA Five -Year Review and Restoration Board Advisory Board Meeting

List of Acronyms

AFBCA	Air Force Base Conversion Agency
AFCEE	Air Force Center for Environmental Excellence
AFRPA	Air Force Real Property Agency
ARARs	applicable or relevant and appropriate requirements
BCT	BRAC Cleanup Team
BLRA	baseline risk assessment
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COPC	chemical of potential concern
DCE	dichloroethylene
DD	Decision Document
DESC	Defense Electronics Supply Center
ESD	Explanation of Significant Difference
FAQ	Frequently Asked Questions
FFS	Focused Feasibility Study
Gentile AFS	Gentile Air Force Station
HI	Hazard Index
HQ	Hazard Quotient
IRIS	Integrated Risk Information System
IRP	Installation Restoration Program
ITSI	Innovative Technical Solutions, Inc.
LTM	Long-Term Monitoring
MCL	maximum contaminant level
NCP	National Contingency Plan
NFRAP	No Further Remedial Action Planned
OEPA	Ohio Environmental Protection Agency
PAHs	polycyclic aromatic hydrocarbons
PCE	tetrachloroethylene
RAOs	remedial action objectives
RBCs	Risk Based Concentrations
RBSC	Risk-Based Screening Criteria
RI	Remedial Investigation
SRI	Supplemental Remedial Investigation
TBC	To be considered
TCE	trichloroethylene
URSG	URS Greiner
VOCs	volatile organic compounds
USAF	United States Air Force
USEPA	United States Environmental Protection Agency

Executive Summary

The United States Air Force conducted a five-year review of the remedies implemented at Installation Restoration Program (IRP) sites at the former Defense Electronics Supply Center at Gentile Air Force Station (AFS). The sites that had actions implemented were evaluated in this five-year review. A five-year review is required because hazardous substances, pollutants, or contaminants remaining at one or more of the sites are above levels that allow for unlimited use and unrestricted exposure. The purpose of the five-year review is to determine whether the action implemented at each site remains protective of human health and the environment. This is the first five-year review for Gentile AFS. The land is currently being transferred on a parcel-by-parcel basis to the City of Kettering for development.

Prior to the selection of a remedy, remedial investigations and assessments of the nature and extent of contamination were conducted. Based on the results of these investigations, remedial action objectives (RAOs) were selected for each IRP site. These objectives were then used to select the remedial actions for the site. During the five-year review, the selected action is reviewed for its continued ability to achieve its goal of protection of human health and the environment, implementation, and system operation and maintenance (if, applicable).

Current data were reviewed for exceedances of RAOs, trends in contaminant concentrations, and changes in contaminant distribution. Based on the data reviewed and the site inspection information, the selected action for each IRP site is functioning as intended in the Decision Document. In addition, there are several sites that were closed with conditional No Further Remedial Action Planned, that may be suitable to have their land use restrictions removed. Implemented institutional controls and long-term monitoring have achieved the RAOs of preventing exposure to the contaminants and of monitoring the groundwater plumes to ensure that they do not become a component of a complete exposure pathway and that it does not migrate offbase. Institutional controls prevent the installation of wells in the contaminated zone and monitoring indicates that the plume is stable. There is no information that calls into question the effectiveness of the remedy. Additionally, this five-year review did not identify any significant issues or concerns that require action beyond that specified in the Decision Document for each site.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name (from CERCLIS): Gentile Air Force Station

EPA ID (from CERCLIS): OH3971524357

Region: 05

State: Ohio

City/County: Montgomery

SITE STATUS

NPL status: ☐ Final ☐ Deleted ☒ Other (specify) Never listed

Remediation status (choose all that apply): ☐ Under Construction ☐ Operating ☒ Complete

Multiple OUs?* ☒ YES ☐ NO

Construction completion date: 9 / 27 / 2002

Has site been put into reuse? ☒ YES ☐ NO

REVIEW STATUS

Lead agency: ☐ EPA ☐ State ☐ Tribe ☒ Other Federal Agency
Air Force Real Property Agency (AFRPA)

Author name: John H. Fringer

Author title: BRAC Environmental
Coordinator

Author affiliation: AFRPA

Review period:** 2 / 18 / 03 to 9 / 17 / 03

Date(s) of site inspection: 6 / 5 / 2003

Type of review:

☐ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only
☒ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead
☐ Regional Discretion

Review number: ☒ 1 (first) ☐ 2 (second) ☐ 3 (third) ☐ Other (specify) _____

Triggering action:

☐ Actual RA Onsite Construction at OU # _____ ☐ Actual RA Start at OU# _____
☐ Construction Completion ☐ Previous Five-Year Review Report
☒ Other (specify) Decision Document for Site R2

Triggering action date : 5 / 3 / 1997

Due date (five years after triggering action date): 12 / 10 / 2003

* ["OU" refers to operable unit.]

** Gentile BCT agreed to complete the 5 Year Review by the end of 2003.

Five-Year Review Summary Form, cont'd.

Issues:

The five year review did not identify any significant issues or concerns that require action beyond that required in the decision document (DD) for each of the sites.

Recommendations and Follow-up Actions:

The review concluded that the remedy for each site as selected by the respective DDs appears to be providing sufficient protection of human health and the environment. The four sites at which groundwater monitoring and land use controls are the remedy will not be closed until contaminant concentrations remain below unrestricted use levels for two consecutive years.

Protectiveness Statement(s):

Remedial actions completed and ongoing at the former Gentile Air Force Station and the current land uses are protective of human health and the environment.

Other Comments:

NA

1.0 Introduction

The United States Air Force (USAF) conducted a five-year review of the remedies implemented at Installation Restoration Program (IRP) sites at the former Defense Electronics Supply Center (DESC) at Gentile Air Force Station (Gentile AFS) (Figure 1). The sites were reviewed because hazardous substances, pollutants, or contaminants remaining at one or more of the sites are above levels that allow for unlimited use and unrestricted exposure. The IRP sites are shown in Figure 2.

During site assessment and site investigation activities 40 IRP sites were identified for further investigation. These sites were investigated through records review and sample and analysis methods to establish the presence/absence of contamination and the relative risk posed by any contamination present in the environment. Of the 40 IRP sites, 30 were identified as requiring no further remedial action planned (NFRAP). Twelve of these sites were closed without restriction and 18 were closed with an industrial use restriction. Agreements were signed by the Air Force Base Closure Agency (AFBCA) (later to become the Air Force Real Property Agency [AFRPA]), Ohio Environmental Protection Agency (OEPA), and the United States Environmental Protection Agency (USEPA). The remaining 10 sites were grouped into 5 decisions documents, which detail remedial actions for the reduction of contaminants, or the reduction of exposure from contaminants, to reduce human health and ecological risks associated with contaminants. Table 1 presents a summary of the IRP sites, the chemicals of concern (COC), the selected remedy, and general comments from the site decision documents.

As shown in Table 1, 12 of the IRP sites were closed with a NFRAP designation based on future unrestricted use of the property and are not discussed further in this report. The other 18 sites closed with a conditional NFRAP were done so contingent upon the site use remaining industrial/commercial. Based on the five-year review requirements these sites require review, because the remedial action selected results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure.

A five-year review is performed because hazardous substances, pollutants, or contaminants remain at one or more of the sites above levels that allow for unlimited use and unrestricted exposure. The purpose of the five-year review is to determine whether the remedy implemented at each site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review Reports. In addition, Five-Year Review Reports identify issues found during the review, if any, and identify recommendations to address these issues.

This Five-Year Review Report is being prepared pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §121 and the National Contingency Plan (NCP). CERCLA §121 states:

"If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews."

The U.S. Air Force interpreted this requirement further in the NCP, Title 40 of the Code of Federal Regulations (CFR) §300.430(f)(4)(ii) which states:

"If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action."

This is the first five-year review for Gentile AFS. The triggering action for this statutory review is the signing of the Site R2, Parcel A DD by the BCT in May 1997.

2.0 Site Chronology

Site chronologies are provided for the sites covered in this Five-Year Review. The chronology of activities for the five sites closed with DDs is presented in Table 2 through Table 5. These tables address site R2 in Parcel A, Parcel B (IRP Sites S1, S3, M1, D2, M7, R1, and C2B), Sites C7 and D1 in Parcel E, and Site C1 in Parcel E, respectively. The key events and their dates are provided. IRP Sites that were closed using a NFRAP designation, contingent upon the site land use remaining industrial/commercial, were investigated during the Phase I and Phase II Remedial Investigations (RIs). In some cases the structure, site features, etc., were removed as part of the base closure and redevelopment activity. Table 6 lists the conditional NFRAP sites, provides dates of removal activity (if any), and the date that the Final Decision was signed by the AFRPA (formerly the AFBCA), OEPA, and USEPA. Table 7 lists the conditional sites and their former use and current use.

3.0 Background

Gentile AFS is located in Montgomery County, Ohio, approximately 4.5 miles southeast of the Dayton Central Business District (Figure 1). The primary mission of the former DESC was to provide electronic spare parts to the United States military and to federal civil agencies. In addition, DESC provided engineering support to the military services by standardizing electronic parts. The former DESC operated at Gentile AFS until December 1996.

Gentile AFS real estate was comprised of approximately 164 fee-owned acres and less than one acre of easement. The land is being transferred on a parcel-by-parcel basis to the City of Kettering for development for industrial, residential and recreational use. As stated in Section 1, 40 IRP sites were identified on the Gentile Air Force Station. Twelve of the sites are closed using a NFRAP designation, based on unrestricted use of the property. Ten of the sites were grouped into five decisions documents, outlining remedial measures. Eighteen are closed using a conditional NFRAP, which was contingent upon the site use remaining industrial/commercial. The five decision documents addressed Site R2, Parcel B (IRP Sites D2, M1, M7, R1, S1, and S3), IRP Sites C7 and D1 in Parcel E, and Site C1 in Parcel E.

Site R2 is located in the vicinity of the southwest corner of former Building 73 near the former railroad spurs that ran along the western side of the building, and consisted of a floor drain leading to a gravel infiltration pit. The infiltration pit was located along the west side of the former building. The discharge pipe to the infiltration pit was connected to a floor drain in a room inside the building that housed four emergency generators. The city demolished Building 73, the floor drain, and the infiltration pit in January 1997 as part of the redevelopment plan at DESC and is now part of an asphalt-covered parking lot.

Parcel B, as designated by the City of Kettering, consists of approximately 11 acres between Building 3 and the western base boundary, and south to the West Branch of Little Beaver Creek. A number of IRP sites were once located within Parcel B. For the most part, Parcel B is now an asphalt-covered parking lot. All buildings west of Building 3 were demolished, and the concrete pad underlying the coal pile area was excavated and removed during construction of the parking lot. The final grade of the parking lot was raised approximately five feet by adding soil.

Sites C7 and D1 are located in Parcel E, which consists of approximately 22 acres, mostly south of the West Branch of Little Beaver Creek. Parcel E is mostly an open field with some trees. Site C7 was an old salvage yard. The site was used for rubbish burning in the 1950's and 1960's. Site D1 was used as a disposal area during the 1950's. Excavations were conducted at Sites C7 and D1 to remove contaminated soil and to restore the site consistent with the surrounding area. The intended future use of the area is development of a combination neighborhood park and residential development.

Site C1 consists of the on-base portion of the West Branch of Little Beaver Creek from the western to the eastern property boundaries. The main channel of the creek, which flows eastward, is approximately 1,650 feet long and averages 15 feet wide. The creek drainage area includes Gentile AFS property and a residential neighborhood.

Table 7 provides a summary of the previous and current uses of the 18 IRP sites closed using a conditional NFRAP.

As the lead agency, in accordance with 40 CFR 300.430 (f)(4), 300.5, and 300.515 (e), the USAF evaluated remedial actions for these sites and presented the selected remedial action in DDs for each site.

3.1 History of Contamination

This section provides a brief history of operations that contributed to the presence of contaminants in soil or groundwater at each of the sites. In addition, a brief summary of the findings of the various site investigations is provided.

3.1.1 Site R2 in Parcel A

Site R2 is located in the vicinity of the southwest corner of former Building 73, near the former railroad spurs that ran along the western side of the building. The site consisted of a floor drain leading to a gravel infiltration pit located along the west side of the former building. The discharge pipe to the infiltration pit was connected to a floor drain, inside the building, in a room that housed four emergency generators. The generators and the gravel infiltration pit were installed in 1973-1974.

The floor drain was located between two generators and the floor under and surrounding the generators had oil and grease stains. The entire floor of the room sloped toward the drain that emptied into the gravel infiltration bed. The gravel bed was filled with approximately six to eight inches of gravel overlying soil. Black staining was noted in the gravel bed in November 1994. The city demolished Building 73, the floor drain, and the infiltration pit in January 1997 as part of the redevelopment plan at Gentile AFS. Soil sampling completed following removal actions showed no further action was required for soil.

Environmental investigations completed at the site showed the presence of cis-1,2-dichloroethylene (DCE) in groundwater at levels in excess of maximum contaminant levels (MCLs).

3.1.2 Parcel B

A large portion of Parcel B was utilized for coal storage. In the past, waste oils, paint thinners, and solvents from paint cleaning operations were poured over the coal prior to incineration. The majority of waste oils generated prior to 1978 were disposed in this manner. Much of the liquid waste was probably absorbed into the coal and incinerated in the boilers. Another portion of Parcel B, near and within Building 80, was used as a pesticide storage area. The building had been used as a paint storage facility, but was more recently used to store pesticides and herbicides used on the base. The storage site was contained within the building on a concrete floor slab with no floor drains. Extensive staining of unknown origin on the concrete floor was noted during a visual inspection. Parcel B is now primarily an asphalt-covered parking lot. All buildings west of Building 3 were demolished, and the concrete pad underlying the coal pile area was excavated and removed during construction of the parking lot. A decision document was issued in April 1999, closing the soil with a no further action planned determination. The final grade of the parking lot was raised approximately five feet by adding soil.

Contamination detected in groundwater during completion of a series of remedial investigations conducted at Parcel B consists primarily of volatile organic compounds (VOCs). These VOCs included three trihalomethanes, carbon tetrachloride, tetrachloroethylene (PCE), trichloroethylene (TCE), methylene chloride, benzene, chlorobenzene, and 1,4-dichlorobenzene. Pesticides were not detected in the groundwater.

3.1.3 Sites C7 and D1 in Parcel E

Site C7 was an old salvage yard within the "loop" formed by Hale and Henry Roads and the shooting range parking lot. The site was used for rubbish burning in the 1950s and 1960s. Small quantities of scrap materials, crushed electronic crystals, and construction rubble could also have been buried at Site C7.

Site D1 was used as a disposal area during the 1950s for construction rubble, scrap electronic parts, asbestos-containing materials, small quantities of waste oil, battery acid, and possibly paint thinner. Miscellaneous construction rubble materials may have been disposed at this site in later years as well.

Remedial investigations showed the presence of VOCs in the soil and groundwater at Site C7. VOCs, including both chlorinated solvents and petroleum related VOCs, were also detected in groundwater at Site D1.

3.1.4 Site C1 in Parcel E

Site C1 consists of the on-base portion of the West Branch of Little Beaver Creek, from the western to the eastern property boundaries. The creek forms the northern boundary of Parcel E, as designated by the City of Kettering. Stormwater runoff, released into drainage ditches from Gentile AFS and from the neighborhood to the west of the base, either enters the creek directly or is directed to the creek by a series of storm drains. Analysis of sediment samples identified polycyclic aromatic hydrocarbons (PAHs), pesticides, and metals as COCs.

3.1.5 NFRAP Sites

The NFRAP sites had a variety of former uses. Table 7 presents the former and current or expected future use of the sites. Table 8 presents the COCs for each of the conditional NFRAP sites.

3.2 Initial Response

Initial response actions for each of the sites are summarized in this section.

3.2.1 Site R2 in Parcel A

No initial response actions were taken at Site R2 in Parcel A.

3.2.2 Parcel B

The initial response at Parcel B included contaminant transport modeling and assessing the risk associated with the residual contamination present in groundwater. Transport modeling indicated that the plume is immobile and movement off-site is unlikely. Evaluation of groundwater risks concluded that remedial action was warranted based on exceedances of the MCL for PCE and TCE.

3.2.3 Sites C7 and D1 in Parcel E

No initial response actions were taken at Site C7 in Parcel E.

The initial response action taken at Site D1 in Parcel E consisted of removal of the above-grade disposal area in September 1999. The extent of excavation was defined via a geophysical survey. Post excavation sampling showed the presence of VOCs in the soil below ground surface, and additional investigation was completed to define the extent of remaining contamination.

3.2.4 Site C1 in Parcel E

The initial response action at C1 in Parcel E consisted of dredging the creek sediments and disposal of the dredged sediments offsite. The removal action was conducted from January through March 2000. Sediments were excavated to pre-established depths of up to six feet over 11 sections of the creek, corresponding to sample locations with elevated contamination. As a result of the removal action, 4,641 tons of stabilized and unstabilized sediment were removed from the creek and transported to the Stoney Hollow Landfill in Dayton, Ohio. The material was disposed as nonhazardous waste.

3.2.5 NFRAP Sites

Initial response activities in many of the NFRAP sites consisted of removal of site features (buildings, tanks, other structures) as part of the site restoration activities. In some cases removal included removal of contaminated soil and confirmatory sampling, the results of which were used for evaluation of risks associated with remaining contaminants. In some cases, no initial response actions were taken (Table 9). Table 10 summarizes the basis for taking these actions. Table 11 summarizes the final decision dates for these sites.

3.3 Basis for Taking Action

The basis for taking action at any of the sites was due to the presence of hazardous substances remaining in selected media above regulatory or risk-based cleanup levels. This section provides a summary of hazardous substances detected at each site and a summary of those hazardous substances that exceeded regulatory or risk-based cleanup levels.

3.3.1 Site R2 in Parcel A

The Site R2 DD states that groundwater COCs were compared to Gentile specific Risk-Based Screening Criteria (RBSC), which are equivalent to USEPA Region 3 Tap Water RBCs. However, based on a decision by the Gentile BCT on February 18, 1999, it was determined that decisions relative to groundwater would not be made on a site-specific, risk assessment basis, but would be based on all monitoring wells meeting MCLs (USAF, 2000). In cases where MCLs do not exist, the RBSCs would continue to be used. As of the most recent (i.e., May 2003) sampling event, only one contaminant of concern at Site R2, cis-1,2-DCE, was detected at a concentration (e.g., 104 and 99.4 [duplicate] $\mu\text{g/L}$) above its respective MCL (70 $\mu\text{g/L}$), and this exceedance was at only one well (R2MW02) at the center of the plume. However, the May 2003 concentration (e.g., 59.0 $\mu\text{g/L}$) of cis-1,2 DCE at R2MW04 was within the range (e.g., 38.0 to 71.1J $\mu\text{g/L}$) near the MCL that has been detected since August 2000.

3.3.2 Parcel B

Hazardous constituents detected in groundwater at Parcel B during characterization sampling included:

Trihalomethanes	Chlorobenzene
Carbon tetrachloride	1,4-dichlorobenzene
PCE	Cadmium
TCE	Iron
Methylene chloride	Lead
Benzene	Manganese

Concentrations of detected VOCs were compared to MCLs or, if an MCL was not available, risk-based screening concentrations. Based on this assessment, TCE and PCE were the only organic chemicals detected in groundwater samples at concentrations exceeding their respective MCLs.

Four metals (cadmium, lead, manganese, and iron) were detected at concentrations in excess of MCLs or Risk-Based Concentrations (RBCs). Except for cadmium, these metals were either

below or sufficiently similar to background and not considered to be chemicals of potential concern (COPCs). Additional assessment determined that the cadmium was associated with suspended solids in the groundwater sample and, therefore, was also eliminated as a COPC.

3.3.3 Sites C7 and D1 of Parcel E

Hazardous constituents detected at Sites C7 and D1 of Parcel E during characterization sampling included:

<u>Groundwater</u>	<u>Soil</u>
TCE	Benzene
cis-1,2-DCE	TCE
Vinyl chloride	cis-1,2-DCE
Benzene	Chloroform
Toluene	Methylene chloride
Ethylbenzene	Carbon Tetrachloride
1,2,4-trimethylbenzene	

MCLs were established as the cleanup goals for groundwater. Cleanup goals for soil were established considering three separate methods. The three methodologies were based on:

- all residential exposures to soil (including ingestion, dermal contact and inhalation of ambient air),
- exposures of future hypothetical residential populations to releases from deeper soil (i.e., greater than 10 feet) to indoor air, and
- protection of groundwater to below MCLs from leaching of contaminants through soil to the aquifer.

The cleanup goal for each chemical was selected from the lower of the residential exposure value (at the 1×10^{-5} target risk level) or the leach-based value. Except for benzene, the lowest value was based on the protection of groundwater. The benzene cleanup goal was based on indoor air exposures. TCE, 1,2-DCE, and vinyl chloride were detected at concentrations in groundwater in excess of the MCL in wells located in Site C7.

3.3.4 Site C1 of Parcel E

Hazardous constituents detected at Site C1 of Parcel E include:

Sediment

PAHs

Pesticides (DDE, chlordane)

Phthalates

Metals (arsenic, iron, lead, mercury, and zinc)

Surface Water

Aluminum

Copper

Iron

Lead

Mercury

Cyanide

The baseline Human Health Risk Assessment identified excess lifetime cancer risks for nearby residential populations using the creek for recreational activities in the range of 1×10^{-3} to 1×10^{-2} , primarily attributable to dermal exposures to PAHs detected in the creek sediment. The baseline ecological risk assessment identified exceedances of sediment or surface water benchmarks in at least one sampling location along the creek for the chemicals listed above.

Cleanup goals were developed for both human and ecological receptors for sediment. The lower of the human health or ecological goal was selected as a risk-based cleanup goal. If the lower value was lower than the routine laboratory reporting limit, the cleanup goal reverted to the reporting limit.

3.3.5 NFRAP Sites

In the case of the IRP sites closed with a NFRAP designation, contingent upon continued use for industrial and commercial purposes a number of criteria were used to evaluate the data. Table 10 provides a summary of the COCs and the evaluation criteria used to conclude that a NFRAP was appropriate.

4.0 Remedial Actions

Based on the results of the remedial investigations and assessments of the nature and extent of contamination, remedial action objectives (RAOs) were developed for Site R2 in Parcel A, Parcel B, Sites C7 and D1 in Parcel E, and Site C1 in Parcel E. The RAOs were then used to select remedial actions for each of the sites. In accordance with CERCLA and the NCP, the overriding goals for any remedial action are protection of human health and the environment and compliance with applicable or relevant and appropriate requirements (ARARs). A number of remedial alternatives were considered for each of the sites, and final selection was made based on implementability, ability to achieve remedial action goals, protectiveness of human health and the environment, and cost. The following provides a summary of remedial actions taken at each of the sites.

4.1 Site R2 in Parcel A

Remedy Selection

For the Phase I RI, the objective at Site R2 was to determine the presence and nature of contamination in the soil and groundwater resulting from the usage of the infiltration pit (URSG, 1996). Soil samples were collected during both the Phase I and Phase II RI. Although none of the chemicals detected in soil exceeded either risk-based screening criteria (RBSC) or background concentrations, it was concluded that contamination from this soil may have leached to the groundwater (USAF, 1997). The soil samples from Site R2 were subsequently included in the human health risk assessment (HHRA) of soil at Parcel A and evaluated for hypothetical exposures to construction workers. Risks and hazard indices estimated in the HHRA were within the target risk range and below 1, respectively.

Decisions regarding remedial action at Site R2 in Parcel A were based on lowering the risk due to detected concentrations of DCE in groundwater. Concentrations of DCE exceeded the risk-based screening levels, based on a non-cancer hazard index of 1. A feasibility study conducted for this site concluded that, based on the continued use of the property for commercial purposes and the lack of evidence of contaminant migration, institutional controls, preventing future groundwater use, and long-term monitoring (LTM) were the appropriate measures taken. The RAOs selected for Site R2 are:

- Prevent exposure to contaminated groundwater by implementing institutional controls

- Monitor the groundwater plume to ensure that it does not become a component of a complete exposure pathway
- Monitor the plume to ensure that it does not migrate off base.

Implementation

Restrictions were placed on the deed upon transfer to the City of Kettering on October 7, 1997. The restrictions for Parcel A are presented in Table 12.

System Operation and Maintenance

System operation and maintenance for Site R2 in Parcel A is limited to LTM of groundwater. There are no active remediation systems in operation. Monitoring is conducted semi-annually, collecting samples from seven wells and analyzing the samples for the presence of VOCs. Annual monitoring cost, including reporting, is approximately \$45,000 per year.

4.2 Parcel B

Remedy Selection

As a result of data collected during the RI and SRI, RAOs were developed for Parcel B to aid in the development and screening of remedial alternatives considered for the DD. Data collected as part of these investigations were compared against MCLs to establish the extent of contamination that potentially required remedial action. The RAOs selected for Parcel B are:

- Restore the groundwater at the site to drinking water quality
- Prevent exposure to contaminated groundwater by implementing institutional controls
- Monitor the groundwater plume to ensure that it does not become a component of a complete exposure pathway
- Monitor the plume to ensure that it does not migrate off base.

The BCT agreed that the remedial action for Parcel B groundwater was to be pump and treat with a deed restriction to prevent groundwater use. The BCT further agreed that, should the pump and treat system prove to be unsuccessful, LTM with a deed restriction was to be implemented as an alternative remedy.

Implementation

A pump and treat system was installed and tested in March 2000. Field observations indicated that a capture zone of sufficient size could not be developed to capture the contaminants detected at S1MW01. Based on these data, it was determined that pump and treat would not be effective at remediating the plume. Therefore, the alternate remedy of LTM and deed restrictions was implemented after issuance and approval of an Explanation of Significant Difference (ESD) (September 8, 2000). Implementation of LTM and deed restrictions allowed the transfer of Parcel B to the City of Kettering on April 19, 2001. The restrictions for Parcel B are shown in Table 12.

System Operation and Maintenance

The pump and treat system operation was found to be ineffective and was shut down. O&M records for the system were not reviewed. Therefore, system operation and maintenance for Parcel B is limited to LTM of groundwater. Monitoring is conducted semi-annually, collecting samples from nine wells and analyzing the samples for the presence of VOCs. Annual monitoring cost, including reporting, is approximately \$48,000 per year.

4.3 Sites C7 and D1 in Parcel E

Remedy Selection

Data collected during the RI and SRI were used to develop RAOs for Parcel E, Sites C7 and D1. The RAOs were used to develop and screen the remedial alternatives considered for the DD. In order to accomplish this goal, the following RAOs were developed:

- The overall goal for Parcel E was to minimize the potential for human contact with contaminated soil, assuming a future residential land use. Exposure pathways to be considered include incidental soil ingestion, dermal contact with soil, and inhalation of chemicals released from soil to both indoor and outdoor air.
- Prevent migration of contaminants from Parcel E soil that would result in groundwater contamination in excess of MCLs.
- Reduce contamination in groundwater beneath Site C7 to MCLs.
- Prevent and/or minimize the potential for human contact with groundwater beneath Site C7 (and D1 implied).

- Prevent the migration of groundwater at concentrations in excess of MCLs beyond the boundary of Gentile AFS.

Based on a comparative analysis of the remedial alternatives considered for Site C7, the BCT selected a remedial alternative that consisted of excavation of the soils that exceed cleanup goals, institutional controls (deed restrictions), and LTM of residual contaminants in groundwater. LTM of groundwater will continue until contaminant levels remain below unrestricted use levels for two years.

Based on a comparative analysis of the remedial alternatives considered for Site D1, the BCT selected a remedial alternative that consisted of excavation of soil that exceeds cleanup goals and off-site treatment of a portion of the soil to allow disposal of the soil as nonhazardous.

An operating properly and successfully evaluation was conducted for measures taken at Sites C7 and D1 in 2003. This evaluation was conducted after the actions were implemented. RAOs, system operations and analytical results were reviewed. The Air Force concluded that the actions implemented were operating properly and successfully and were consistent with the provisions of CERCLA.

Implementation

Excavation of the soil at Sites C7 and D1 was completed in September 2002. LTM was initiated in October 2002 and will continue quarterly for one year. The BCT is evaluating the reduction of monitoring frequency. Parcel E has not been transferred at this time. The proposed restrictions are shown in Table 12.

A total of 9,913 tons of soil was removed from IRP Site C7. Approximately 25 percent of the material was considered clean (below action levels) and used as backfill for the excavation. The balance was disposed as hazardous waste or nonhazardous waste, depending on characterization of the waste material. Details regarding the removal action can be found in *Final Remedial Action Site Summary Report Gentile Air Force Station, Parcel E Soil Removal Action Project*, (ITSI, January 2003).

At total of 1,387 tons of soil was removed from Site D1 during excavation activity. Approximately 25 percent of the material was considered clean and either used as backfill for the excavation or for non-residential or construction use. The balance was disposed as hazardous

waste or non-hazardous waste, depending on characterization of the waste material. Details regarding the removal action can be found in the Parcel E Soil Removal report (ITSI, January 2003).

System Operation and Maintenance

System operation and maintenance for Site C7 and D1 in Parcel E is limited to LTM of groundwater. There are no active remediation systems in operation. Regular monitoring is conducted, collecting samples from nine wells and analyzing the samples for the presence of VOCs. Monitoring will continue until contaminant levels remain below unrestricted use levels for two years. Annual monitoring cost, including reporting, is approximately \$50,000 per year.

4.4 Site C1 in Parcel E

Remedy Selection

RAOs were developed for Site C1 in Parcel E as a result of data collected during the RI and SRI. The RAOs were used in the development and screening of remedial alternatives considered for the DD. The following RAOs were developed:

- Minimize the potential for contact by human and ecological receptors with contaminants in sediment that exceed cleanup goals
- Provide a permanent remedy that will not have adverse effects (e.g., flooding, erosion) to the creek
- Provide a low maintenance remedy that will conform to a park setting, the proposed reuse scenario for the creek.

Based on these RAOs, a removal action was conducted to remove contaminated sediment from the creek. The removal action was conducted from January through March 2000 as a non-time critical action. Sampling conducted after excavation activities showed the presence of PAHs in excess of risk-based cleanup goals. Based on this, the BCT decided on the use of institutional controls as the final remedy.

Implementation

Institutional controls in the form of a use restriction will be included in the deed conveying the property to the City of Kettering, when the parcel is transferred. Site controls have been implemented with the placement of signs in the vicinity of the creek. The signage warns of the

potential hazard and discourages exposures. The use restriction shall also be included in the deed conveying the property to the City of Kettering, at the time of transfer. The restrictions are shown in Table 12.

System Operation and Maintenance

There are no active remediation systems in operation. Signage will be monitored by the City of Kettering. Repairs or replacements will be performed as necessary.

4.5 NFRAP Sites

Eighteen of the 30 IRP sites closed using a NFRAP designation, were done so with restrictions on future use of the site. Table 11 presents a list of the sites closed as NFRAP, and contingent upon the site remaining industrial/commercial.

4.6 Institutional Controls

The remedial actions selected for Site R2 in Parcel A, Parcel B, Sites C7 and D1 in Parcel E, and Site C1 in Parcel E included institutional controls to prevent or minimize exposure to contaminated groundwater or sediment. To fulfill its legal obligation to ensure the effectiveness and protectiveness of its selected remedies, including the site controls and institutional controls specified in Gentile DD, the Air Force will ensure that its environmental deed covenants at Gentile AFS are still in place and have not been violated during the CERCLA Five-Year Review. This task will include coordinating with the City of Kettering to ensure that current owners' deeds contain the currently appropriate environmental covenants.

A review of each of the deeds that transferred the aforementioned properties to the City of Kettering was conducted in the offices of the Montgomery County Auditor. The deeds were reviewed for the required institutional controls; a summary of these deed restrictions and covenants is included as Table 12.

5.0 *Progress Since the Last Five-year Review*

This is the first five-year review. The next five-year review will be conducted in 2008.

6.0 Five-Year Review Process

The five-year review was completed following USEPA guidance in *Comprehensive Five-Year Review Guidance* (EPA 540-R-01-007). This section provides a summary of the process used for the five-year review for the DESC, Gentile AFS.

6.1 Administrative Components

Members of the BCT initiated the five-year review in March 2003. The five-year review team was led by Mr. John Fringer, Base Environmental Coordinator, Air Force Real Property Agency, and included the USEPA and OEPA.

The review schedule was established by the review team and included the following components:

- Community Involvement
- Document Review
- Data Review
- Site Inspection
- Deed Review
- Five-year Review Report Development and Review.

6.2 Community Involvement

The AFRPA published a notice of a public meeting to present the findings of the five-year review. The notice appeared in the Dayton Daily News on August 10, 2003. A copy of the Public Notice is included as Attachment 2. A copy of the CERCLA Five-Year Review Report will be added to the Administrative Record at the former Gentile AFS as well as the Information Repository located in the Kettering Public Library, Wilmington-Stroop Branch, 3980 Wilmington Pike, Kettering, Ohio.

A meeting of the Restoration Advisory Board was held on August 20, 2003. The meeting, open to the public, was held to present a summary of the review process and the findings of the review. Public input was solicited.

6.3 Document Review

This five-year review consisted of a review of relevant documents including monitoring data and monitoring reports. Attachment 1 lists the documents reviewed as part of the five-year review.

6.4 Data Review

LTM of groundwater has been implemented at Site R2 in Parcel A, Parcel B, and Sites C7 and D1 in Parcel E. Available data were assessed for exceedances of RAOs, trends in contaminant concentrations, and changes in contaminant distribution.

6.4.1 Site R2 in Parcel A

LTM at Site R2 in Parcel A was initiated in August 1998. The data show little change in the extent of contamination, but there is a decreasing trend in cis-1,2-DCE concentrations, as shown on Figure 3. Decisions relative to groundwater are based on all monitoring wells meeting MCLs (USAF, 2000), where MCLs had been established for the COCs. Where MCLs do not exist, the RBSC would be used. As of May 2003, only one contaminant (cis-1,2-DCE) at one monitoring well (R2MW02) was detected at a concentration above the MCL. The concentration of cis-1,2-DCE has been regularly decreasing at this well and is currently near the MCL (70 µg/L) as shown in Tables 13 and 14.

6.4.2 Parcel B

LTM of groundwater at Parcel B was initiated in February 2001. The data show little change in the nature and extent of contamination present in groundwater, as shown in Tables 15 and 16. The extent of impacted groundwater has been stable. PCE was detected at concentrations in excess of the MCL in well S1MW01 on three occasions (August 2001, May 2002, and November 2002). TCE was detected at concentrations in excess of the MCL in well S1MW04 on two occasions (May 2002 and November 2002). Concentrations of contaminants detected in S1MW01 and S1MW04 were slightly above the MCL. Other chlorinated organics detected, but below MCLs, include 1,1,1-trichloroethane, carbon tetrachloride, and cis-1,2-DCE. There is no MCL for 1,1-dichloroethane; however, concentrations were detected below the tap water RBC for 1,1-dichloroethane. Figure 4 displays the analytical results for S1MW01 and S3MW02.

Groundwater elevation data indicate a general increase in groundwater elevation over the whole area. On average, the groundwater elevation has increased over 1.5 feet during the period of record (2001 to 2002).

6.4.3 Sites C7 and D1 in Parcel E

LTM of groundwater at Parcel E was initiated in October 2002. The data show the presence of vinyl chloride and cis-1,2-DCE in monitoring well D1MW42 and TCE in wells D1MW49 and D1MW50 at concentrations greater than MCLs. Overall, the groundwater monitoring results suggest that soil remediation has been successful in reducing or eliminating contaminants leaching into the groundwater. Table 17 summarizes detected contaminant concentrations in Parcel E monitoring wells. No movement or migration of the existing contaminant plume has been observed at these sites. Figure 5 presents the analytical results for D1MW42 at Site C7. Figure 6 presents the analytical results for D1MW50 at Site D1.

6.4.4 NFRAP Sites

No action or monitoring has occurred at the NFRAP sites since the signing of the DD.

6.5 Site Inspection

Site inspections specific to the five-year review were not conducted. Both the Air Force (or it's representative) and the City of Kettering are at the site frequently due to site development and routine monitoring. Additional inspections were not deemed necessary.

6.6 Interviews

US EPA guidance states:

“Interviews should be conducted, **if necessary**, to provide additional information about a site's status.”

Because of the frequent interaction with the City of Kettering and active involvement in the transfer of the property, interviews were not deemed necessary to obtain additional information about the sites.

7.0 Technical Assessment

The primary goal of the five-year review is to determine whether the remedy at a site is protective of human health and the environment. To provide a framework for organizing and evaluating data and information and to ensure that all relevant issues are considered when determining the protectiveness of the remedy, USEPA guidance lists three questions to consider. The questions are as follows:

- Question A: Is the remedy functioning as intended by the DD?
- Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?
- Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

The following sections provide responses to the questions for each of the sites being reviewed. The ARARs and RAOs for Gentile AFS are summarized in Tables 18 and 19, respectively. Four sites are presented in detail in the following sections. The NFRAP designated sites are addressing together at the end of this chapter.

7.1 Site R2 in Parcel A

Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, ARARs, and risk assumptions and the results of the site inspection indicate that the remedy is functioning as intended by the DD. Implemented institutional controls and LTM have achieved the RAOs of preventing exposure to the contaminants and of monitoring the groundwater quality and use to ensure that it does not become a component of a complete exposure pathway and that it does not migrate offbase. Institutional controls prevent the installation of wells in the contaminated zone and monitoring indicates that the plume is stable and there is no evidence of a completed exposure pathway or migration.

There were no opportunities for system optimization during this review. The monitoring well network provides sufficient data to assess the current status of the contaminant plume. Contaminant concentrations have remained stable.

Institutional controls placed on the deed, restrict the installation of groundwater wells in the area, and no activities were observed that would be violations of the institutional controls. Site redevelopment of the area for industrial/commercial use will minimize the chance of a well being installed for potable water because the City of Dayton provides water to the site. Additionally, the City of Kettering's Economic Development Overlay restricts the installation of private groundwater wells in the city. Also, the Air Force through a letter notification process will inform the current deed holders of the environmental use restrictions on their property.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy still valid?

The following documents were reviewed with respect to risk assessment data and assumptions:

- URS Greiner (URSG), 1997. *Site and Risk Characterization for Parcel A at Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio. Final.* March.
- USAF, 1997. *Decision Document, Site R2 Floor Drain to Infiltration Pit at Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio. Final.* September.
- U.S. Environmental Protection Agency, (USEPA) 2003, *Region III Risk-Based Concentration Table*, Philadelphia, PA. April 25.

Changes in ARARs and TBCs

Groundwater at Site R2 is impacted with 1,2-DCE. The MCLs for cis-1,2-DCE and trans-1,2-DCE are 70 µg/L and 100 µg/L, respectively. These MCLs are considered to be the cleanup levels and are compared against the observed concentrations.

Changes in Land Use and Exposure Assumptions

There is no current use of groundwater at the property, nor is there any predicted future use. Based on current information, groundwater contamination is not expected to reach the property boundary or the creek. The selected remedy of application of deed restrictions was intended to serve as a permanent solution for Parcel A such that the grantee would be prohibited from installing any wells for drinking water or any other purpose that would result in the use of underlying groundwater. This deed restriction remains in effect. Therefore, there is no current or anticipated exposure to groundwater at Parcel A.

Changes in Toxicity Values

Two VOCs (cis- and trans-1,2-DCE) were detected in monitoring well (R2MW02) located within the former filtration pit (although concentrations of trans-1,2-DCE have always been well below its MCL). Before a Gentile BCT agreement in 1999 that MCLs (where available for a chemical) would be the cleanup goals for groundwater contaminants, the highest concentration of each chemical was compared to its RBSC (USAF, 1997). The RBSCs for these chemicals are equivalent to USEPA Region III RBCs for tap water. Although not relevant as cleanup goals, comparisons of the RBCs for cis- and trans-1,2-DCE to current values indicate that the RBCs for these chemicals have not changed (USEPA, 2003).

Changes in RAOs and Cleanup Goals

Quarterly and now semi-annual groundwater monitoring have been conducted to establish the extent of groundwater contamination at Site R2. There are MCLs for cis 1,2-DCE (70 µg/L) and trans 1,2-DCE (100 µg/L). These values represent concentrations that are protective of human health and, therefore, can be used as a basis of comparison for data collected as part of LTM of groundwater at the site.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

None of the site information calls into question the protectiveness of this remedy.

Technical Assessment Summary – Site R2 in Parcel A

Based on the data reviewed and the site information, the remedy is functioning as intended in the DD. Changes in the physical conditions of the site will increase the effectiveness of the remedy by limiting the opportunities for installation of groundwater wells. There have been no changes in the MCLs for the contaminants of concern, and there have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. There is no information that calls into question the effectiveness of the remedy.

7.2 Parcel B

Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, ARARs, and risk assumptions and the results of the site inspection indicate that the remedy is functioning as intended by the DD and as modified by the ESD. Institutional controls and LTM have achieved the RAOs of preventing exposure to the contaminants and monitoring the groundwater quality and use to ensure that it does not become a component of a complete exposure pathway and that it does not migrate off base. Institutional controls prevent the installation of wells in the contaminated zone, and plume stability and migration are evaluated via groundwater monitoring, which is a safeguard against completion of exposure pathways.

There were no opportunities for system optimization during this review. The monitoring well network provides sufficient data to assess the current status of the contaminant plume. Contaminant concentrations have remained stable.

Institutional controls placed on the site prevent the installation of groundwater wells in the area. No activities were observed that would be violations of the institutional controls. Site redevelopment of the area as an industrial park will minimize the chance of a well being installed for potable water use. The City of Dayton provides water to the site. Additionally, the City of Kettering's Economic Development Overlay restricts the installation of private groundwater wells in the city. Also the Air Force, through its LUC/IC Communication Plan, will use notification letters to inform the current deed holders of the current environmental deed restrictions on their property.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy still valid?

The following documents were reviewed with respect to risk assessment data and assumptions:

- URSG, 1997. *Phase II Remedial Investigation Report. Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio. Draft. May.*
- URS, 1999. *Supplemental Remedial Investigation for Parcel B. Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio. Draft Final. December.*

- U.S. Air Force, 1999. *Decision Document, Parcel B Soils at Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio. Final.* March.
- U. S. Air Force, 2000. *Decision Document, Parcel B Groundwater at Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio. Final.* September.
- U. S. Air Force, 2001. *Supplemental Environmental Baseline Survey. Parcel B, Gentile Air Force Station, Kettering, Ohio. Final.* September.

Changes in ARARs and TBCs

Two areas of groundwater contamination within Parcel B were recommended for further investigation (USAF, 2000). According to a Gentile BCT decision made on February 18, 1999, decisions relative to groundwater will not be made on a site-specific risk assessment basis; rather, they will be based on all monitoring wells meeting MCLs. Where MCLs were unavailable, USEPA Region III tap water RBCs (USEPA, 1999) were used for comparison purposes. The MCLs and RBCs for VOCs and metals detected in groundwater at Parcel B are listed in the DD (USAF, 2000). Of these values, the MCL for arsenic has been reduced from 50 µg/L to 10 µg/L. The rule became effective on February 22, 2002. The date by which systems must comply with the MCL of 10 µg/L is January 23, 2006. No other standards have changed.

Regardless of the current MCL for arsenic, however, LTM of groundwater and institutional controls, as described in the *Supplemental Environmental Baseline Survey* (USAF, 2001), continue to be protective because exposure to groundwater is prevented. According to statistical comparisons that were performed as part of the *Supplemental Remedial Investigation for Parcel E and Site-Wide Background Characterization Report* (URSG, 2000), site-wide groundwater concentrations were significantly below background concentrations for arsenic.

Changes in Land Use and Exposure Assumptions

Gentile AFS is being transferred on a parcel-by-parcel basis to the City of Kettering for development (USAF, 2000). It is the city's intent that, upon having the property transferred, they will deed restrict the property to others such that the grantee will be prohibited from installing any wells for drinking water or any other purpose that would result in the use of underlying groundwater. Based on the institutional controls for groundwater, there is no current exposure to groundwater. Likewise, no future exposure to groundwater at Parcel B is anticipated.

With respect to soils at Parcel B, the only unacceptable human health hazard was exposure to a construction worker due to the presence of chlordane in soil near Site S3 (USAF, 1999); however, the chlordane-contaminated soil was removed. In addition, the placement of clean soil during regrading of the area and the use of asphalt to cover the parking lot has effectively eliminated any further direct soil exposures. If the parking lot is removed or otherwise altered and the area is used for nonindustrial purposes, a complete exposure pathway could be redeveloped. Therefore, the institutional control requiring industrial land use by deed restriction is required.

Changes in Toxicity Values

The MCLs for COPCs in Parcel B groundwater are shown in Tables 1 and 2 of the DD (USAF, 2000). For COPCs that did not have established MCLs, USEPA Region III tap water RBCs served as cleanup levels. There were no changes to RBCs or corresponding toxicity values for the organic COPCs (acetone, 2-butanone, 1,1-dichloroethane, and naphthalene) and inorganic COPCs (aluminum, iron, manganese, and zinc) in Parcel B groundwater.

Changes in RAOs and Cleanup Goals

The RAOs identified in the DD and in Section 4.2 of this review have not changed.

MCLs were established as the groundwater cleanup goals as presented in the DD (Tables 1 and 2) (USAF, 2000). The MCL for arsenic has been reduced from 50 µg/L to 10 µg/L. This rule became effective on February 22, 2002. The date by which systems must comply is January 23, 2006. However, the remedy itself continues to be protective because exposure to groundwater is prevented.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no information that calls into question the protectiveness of this remedy.

Technical Assessment Summary – Parcel B

Based on the data reviewed and the site inspection information, the remedy is functioning as intended in the DD and as modified by the ESD. Changes in the physical conditions of the site, by construction of a parking lot over Parcel B, will increase the effectiveness of the remedy by

limiting the opportunities for installation of groundwater wells. There have been no changes in the MCLs for the contaminants of concern, and there have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. There is no information that calls into question the effectiveness of the remedy.

7.3 Sites C7 and D1 Within Parcel E

Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, ARARs, and risk assumptions and the results of the site inspection indicate that the remedy is functioning as intended by the DD. An OPS Demonstration report for Sites C7 and D1 (which is currently being reviewed by the U.S. EPA) states that excavation of soil at Site C7 and D1 and institutional controls of groundwater at both sites have achieved the RAOs of preventing exposure to the contaminants. The contaminant removal from source area soils has reduced or eliminated contaminant leaching into groundwater such that groundwater contaminant concentrations have significantly decreased and should continue to decrease over time to unrestricted use levels. In the meantime, institutional controls consisting of deed restrictions prohibiting access to or disturbance of groundwater are a standard, reliable means of ensuring that the contaminated groundwater does not become a component of a complete exposure pathway and that it does not migrate off base. Excavation of soil in Sites C7 and D1 removed contaminants that could potentially migrate to groundwater. Analysis of samples collected after excavation documented the removal of contaminants to below concentrations of concern. Institutional controls will prevent the installation of wells in the contaminated zone; monitoring indicates that the plume is stable and there is no evidence of complete exposure or migration.

There were no opportunities for system optimization during this review. The monitoring well network provides sufficient data to assess the current status of the contaminant plume.

Institutional controls placed on the site will prevent the installation of groundwater wells in the area. No activities were observed that would be violations of the institutional controls. The City of Dayton provides water to the site.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy still valid?

The following documents were reviewed with respect to risk assessment data and assumptions:

- URS Greiner (URSG), 1997. *Phase II Remedial Investigation. Volume I. Defense Electronics Survey Center, Gentile Air Force Station, Kettering, Ohio. Draft.* May.
- URS, 2000. *Supplemental Remedial Investigation for Parcel E and Base-Wide Background Characterization Report, Volume I. Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio. Draft Final.* March.
- URS, 2001. *Focused Feasibility Study Report for Parcel E, Volume II. Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio. Draft Final.* June.
- U.S. Environmental Protection Agency (USEPA), 2001. *Trichloroethylene Health Risk Assessment: Synthesis and Characterization.* Office of Research and Development, U.S. Environmental Protection Agency, Washington, DC. August.
- U.S. Air Force (USAF), 2002. *Decision Document, Sites C7 and D1 within Parcel E at Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio. Final.* July.
- U.S. Environmental Protection Agency (USEPA), 2002. *Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils.* Office of Research and Development, U.S. Environmental Protection Agency, Washington, DC. EPA530-F-02-052. November.
- Innovative Technical Solutions, Inc. (ITSI), 2003. *Final Remedial Action Site Summary Report. Gentile Air Force Station, Parcel E, Soil Removal Action Project. Kettering, Ohio.* January.
- U.S. Environmental Protection Agency (USEPA), 2003. *Integrated Risk Information System (IRIS).* On-Line Database.

The baseline risk assessment (BLRA) for Site D1 was conducted as part of the Phase II RI (URS, 1997). A screening-level evaluation was performed for Site C7 as part of the SRI (URS, 2000). The BLRA was revised to recalculate risk estimates based on the analytical data from soil collected in July 2000 and January 2001 as part of the data acquisition phase of the Focused Feasibility Study (FFS) (URS, 2001). Two elements warranted the revision of the BLRA: 1) the detection of additional COPCs in Site C7 soil, and 2) the detection of VOCs in Site D1 soil. According to the FFS, the re-characterization of risks was accomplished using the same assumptions in the original BLRA (URS, 2000) and the Gentile AFS risk assessment methodology (URS, 1995). Comparison of the preliminary cleanup goals with the sampling data

collected to support the FFS resulted in the designation of two areas for soil remediation (USAF, 2002). Soil removal was accomplished in August and September 2002 (ITSI, 2003).

Changes in ARARs and TBCs

Groundwater monitoring will continue until contaminant levels remain below unrestricted-use levels for two years (USAF, 2002). According to a Gentile BCT decision made on February 18, 1999, decisions relative to groundwater will not be made on a site-specific risk assessment basis--rather, they will be based on all monitoring wells meeting MCLs. The MCLs for COCs in groundwater at D1 are listed in the SRI. The MCLs have not changed.

Changes in Land Use and Exposure Assumptions

Current land use surrounding Parcel E is primarily residential except for a redeveloped industrial park. The City of Kettering's intended future use of Parcel E includes both park and residential uses. Using the data from the FFS, risks were recalculated for both Site C7 residential populations and for the Site D1 park worker. It was assumed in the DD (USAF, 2002) that all Parcel E areas (i.e., both Sites C7 and D1) would be remediated based on residential exposures so as to meet requirements for unrestricted future land use. As described in Section 4.3 of this review, excavation of soil at Sites C7 and D1 was completed in September 2002 (ITSI, 2003). The potential for human contact with soil was subsequently minimized as a result of the soil removal. As of this review, the anticipated future land uses for Parcel E have not changed (USAF, 2002).

As stated in Section 3.3.3, cleanup goals for soil were established considering three separate methods. The three methodologies were based on:

- all residential exposures to soil (including ingestion, dermal contact and inhalation of ambient air),
- exposures of future hypothetical residential populations to releases from deeper soil (i.e., greater than 10 feet) to indoor air, and
- protection of groundwater to below MCLs from leaching of contaminants through soil to the aquifer.

The cleanup goal for each chemical was selected from the lower of the residential exposure value (at the 1×10^{-5} target risk level) or the leach-based value.

According to the BLRA, the indoor air pathway contributed the majority of risks for Site C7. As part of the evaluation of the residential scenario in the FFS (URS, 2001), indoor air exposures associated with vapor intrusion were evaluated. USEPA has recently published new guidance regarding the indoor air pathway entitled "Evaluating the Vapor Intrusion into Indoor Air Pathway for Groundwater and Soils" (USEPA, 2002) and issued a revision of the Johnson & Ettinger model that is used to estimate indoor air concentrations in June 2003 (USEPA, 2003). Although a set of cleanup levels were calculated for the indoor air pathway, cleanup goals for all chemicals except benzene were based on the protection of groundwater. Benzene was not detected in post-excavation samples. Therefore, changes in the guidance and the model would not impact the cleanup goals applied during the soil removal.

Changes in Toxicity Values

The toxicity values were reviewed to determine whether cleanup levels that applied at the time of the remedy had changed. Cleanup levels are given in the DD (USAF, 2002) for benzene, carbon tetrachloride, chloroform, methylene chloride, TCE, and vinyl chloride. Since the DD was issued in July 2002, the oral and inhalation toxicity values for TCE and vinyl chloride have become more stringent. With the exception of benzene, however, cleanup levels for these chemicals were based on the protection of groundwater to below MCLs from leaching of contaminants through soil to the aquifer. The MCLs for these chemicals have not changed.

Changes in RAOs and Cleanup Goals

The removal of contaminated soil at Sites C7 and D1 meets the RAO for minimizing the potential for human contact with soil. In addition, contaminated soil no longer serves as a potential source of COCs that could migrate from the soil to groundwater. The RAOs concerning the reduction of contamination in groundwater and the prevention of human contact with contaminated groundwater have not changed.

For most chemicals (with exception of benzene), cleanup goals for soil were based on the protection of groundwater, not indoor air exposures. Cleanup goals for groundwater were set as MCLs. None of the MCLs for the COCs at C7 and D1 has changed since the remedy was selected.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no information that calls into question the protectiveness of this remedy.

Technical Assessment Summary – Sites C7 and D1 within Parcel E

Based on the data reviewed and the site inspection information, the remedy is functioning as intended in the DD. Changes in the physical conditions of the site will increase the effectiveness of the remedy by limiting the opportunities for installation of groundwater wells. There have been no changes in the MCLs for the contaminants of concern, and there have been no changes to the standardized risk assessment methodology that could affect the protectiveness of the remedy. There is no information that calls into question the effectiveness of the remedy.

7.4 Site C1 within Parcel E

Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, ARARs, and risk assumptions and the results of the site inspection indicate that the remedy is functioning as intended by the DD. Implementation of institutional controls and site controls at Site C1 (limiting access to the creek) will achieve the RAOs of preventing exposure to contaminants. Limiting access minimizes exposure to contaminants remaining in the sediment.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy still valid?

The following documents were reviewed with respect to risk assessment data and assumptions:

- URS Greiner (URSG), 1997. *Phase II Remedial Investigation, Volume I. Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio. Draft. May.*
- URS Consultants (URS), 1999. *Revised Engineering Evaluation/Cost Analysis, Site C1. Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio. Final. September.*
- URS Consultants (URS), 2000. *Supplemental Remedial Investigation for Parcel E and Base-Wide Background Characterization Report. Final. October.*

- Jacobs Engineering Group (Jacobs), 2000. *Summary Report for the Site C1 Removal Action. Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio. Draft Final. July.*
- U.S. Environmental Protection Agency (USEPA), 2001. *Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment).* Draft. September.
- USAF, 2002. *Decision Document, Site C1 within Parcel E at Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio. Final. July.*

Based on results of the RI, a non-time-critical removal action was performed at Site C1 to remove creek sediments with concentrations of PAHs, pesticides, and metals above risk-based cleanup goals (USAF, 2002). Chemical-specific cleanup levels based on human exposures were based on the same exposures that were used in the BLRA (i.e., a target cancer risk of 1×10^{-6} to 1×10^{-4} and a target site Hazard Index (HI) of 1.0. The ecological cleanup levels were based on a Hazard Quotient (HQ) of 0.1 (USAF, 2002).

Although impacted sediments were removed as planned, potential residual risk remains as a result of PAH concentrations in remaining sediment. Further removal of sediments was deemed impracticable. Contamination attributable to the Air Force has been removed. However, on-going releases from asphalt parking lots and upstream sources remain. Institutional controls were selected as the final remedy for Site C1 to minimize potential residual risks.

Changes in ARARs and TBCs

The ARARs that were in effect at the time of the remedy selection have not changed.

Changes in Land Use and Exposure Assumptions

Current land use surrounding Parcel E is primarily residential except for the redeveloped industrial park, which was once part of Gentile AFS. The City of Kettering's intended future use of Parcel E includes both park and residential land uses. The BCT agreed that the final remedy for Site C1 would be a site control (in the form of signs stating "No Swimming, Wading, Playing, or Fishing in the Water"), and institutional controls in the form of a use restriction in the deed, that together will limit access to and use of the creek by the property recipient and general public. The site control and use restrictions were intended to prohibit swimming, fishing, or other recreational use that would expose an individual to contaminants in the creek sediments. The site control has been instituted at Site C1. Therefore, the current land use and exposure

assumptions (i.e., no exposure via swimming, fishing, or other recreational use) have not changed. Furthermore, no additional exposure pathways for human health have been identified. The Air Force is not aware of future projects (e.g., dredging, excavation) that may result in worker contact with sediment.

However, recent USEPA guidance on dermal risk assessment is now available. This guidance indicates that the baseline and residual risk assessment (conducted in 1998 and 2000) for recreational exposures at the creek were overly conservative. Based on the 2001 USEPA guidance (RAGS, Part E), several exposure factor assumptions (including the dermal absorption factor and the soil-to-skin dermal adherence factor) and the calculation of exposure point concentration (using the dry weight concentrations) were overestimated.

With regard to ecological receptors, the quality of aquatic habitats was found to be limited because the creek was historically managed as a drainage way (URS, 1999). The results of the post-removal action risk assessment included a calculation of HQs for aquatic populations (USAF, 2002). The HQ values for environmental populations were calculated on a chemical-by-chemical and sample-by-sample basis. These values exceeded the action level of 1 for arsenic, iron, and PAHs at various locations. Exceedances of ecological benchmark values, however, were highest at one location in the Eastern Drainage Ditch, which is intermittent and does not provide quality habitat. The removal action itself (i.e., removal of sediment) would have also been disruptive to existing biota at the time of the remedy. In addition, post-excavation levels of arsenic and iron in sediment were within the range of background levels of arsenic and iron in soil. The background data for soil were characterized in the *Supplemental Remedial Investigation for Parcel E and Base-Wide Background Characterization Report* (URS, 2000). There were no exceedances of the UTLs for background soil for arsenic (13.6 mg/kg) or iron (25,003 mg/kg) (Table I.2, URS, 2000). The 95 percent UTLs were calculated as part of the background characterization report to represent the value below which 95 percent of the population of data are expected to fall (with 95 percent confidence). The residual cancer risk—as estimated in the 2000 risk assessment—for PAHs remaining in the sediments exceeds 1×10^{-4} for all recreational populations. Adjustments to the aforementioned inputs to the estimate of risk would significantly lower residual risk estimates.

Changes in Toxicity Values

The toxicity values were reviewed to determine whether the values used to calculate cleanup levels had changed. Based on new guidance for dermal risk assessment (USEPA, 2001), there were changes to some of the factors and assumptions used to calculate dermal toxicity values. Of these, the oral absorption factors for beryllium and manganese are slightly more stringent. However, the impacts of these changes would be expected to be minimal, especially because PAHs are the primary contributors to risk at the creek. As previously discussed (under “Changes in Land Use and Exposure Assumptions”), indications are that recalculating risk using the 2001 USEPA dermal exposure factor assumptions and wet weight PAH sediment concentrations would result in a risk estimate that is more reasonable as well as more representative of exposures in the creek. The Gentile BCT is currently evaluating whether collecting additional creek sediment samples and recalculating residual risks based on the new dermal pathway guidance is appropriate to verify whether the risks are currently within an acceptable range. If the risks were determined to be acceptable, an ESD would then be prepared to document this “Significant Change” to the Decision Document for Site C1 whereby the institutional control (e.g., the signs) and deed restriction (limiting creek access) would be removed.

Changes in RAOs and Cleanup Goals

The RAOs for the remedy have not changed in as much as the intent of the RAO is to minimize the potential for contact by humans and ecological receptors to sediment in the creek. Given the continuing contribution of contamination from upgradient sources, the DD (USAF, 2002) has concluded that further remediation is impractical.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no information that calls into question the protectiveness of this remedy.

Technical Assessment Summary – Site C1 within Parcel E

Based on the data reviewed and the site inspection, the remedy is functioning as intended in the DD. There is no information that calls into question the effectiveness of the remedy.

7.5 NFRAP Sites

Question A: Is the remedy functioning as intended by the decision documents?

In all cases the remedy is functioning as intended. The facility is under redevelopment, the majority of which is being used for industrial commercial purposes. In no case is one of the IRP sites closed using a NFRAP designation, with conditions, in an area slated for residential or recreational purposes.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy still valid?

Eighteen sites are closed using a conditional NFRAP, which was contingent upon the site use remaining industrial/commercial. The NFRAP sites were reviewed with respect to the ARARs, the exposure assumptions and the toxicity data that were in effect at the time of the decision for the site. Where applicable, sampling results for previous removals were evaluated against both industrial and residential criteria. No RAOs were specified because no remedy other than institutional controls was selected. Table 20 provides the results of this evaluation for each site. For eight of these sites (D5, O2, O3, T1, T2, T3, S8, and S9), the rationale for removing institutional controls (e.g., industrial/commercial land use restrictions) is also presented.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no information that calls into question the protectiveness of this remedy.

8.0 Issues

This five-year review did not identify any significant issues or concerns that require action beyond that specified in the DD for each site. The plume size has remained constant with consistently decreasing concentrations in the groundwater at Site R2 in Parcel A, Parcel B, and Sites C7 and D1 in Parcel E.

As shown in Table 1, several sites were designated for NFRAP with the condition that the land use would remain commercial/industrial. As part of this review, chemical concentrations for these sites were compared to applicable residential criteria to determine whether it might be possible to eliminate land use restrictions.

For Sites O2, O3, T1, T2, and T3, site concentrations were originally compared with Region IX PRGs for industrial soil representing a target risk range of 1×10^{-6} and a Hazard Quotient (HQ) of 1 (Jacobs, 1997). None of the concentrations exceeded the PRGs except arsenic. However, arsenic concentrations were found to be within background levels for soil. Comparison with current Region IX PRGs for residential soil at a target risk range of 1×10^{-6} and an HQ of 1 yielded similar results.

For Site S8, site concentrations of Aroclor-1260 were compared to current Region III RBCs for both industrial and residential soil. Based on a change in the toxicity value for polychlorinated biphenyls (PCBs), site concentrations were below the updated residential RBC.

Investigations conducted at Sites D5 and S9 showed no contaminants of concern present in the environment yet site use restrictions were placed on the property deed.

An Explanation of Significant Difference (ESD) was recently issued for Site C6 (June 5, 2003). Based on further evaluation of potential residential exposures to lead, the Statement of Basis of the ESD, indicated that lead concentrations in the soil at Site C6 do not pose an unacceptable risk to human health and is suitable for unrestricted use. Site C6 is therefore designated a NFRAP site without restrictions.

The Air Force will consider proposing removing restrictions to these sites in the future.

9.0 Recommended Actions and Follow up

This five-year review concluded that the remedy for each site as selected by the respective DDs appears to be providing sufficient protection of human health and the environment. Therefore, these actions (which include, as appropriate, LTM and institutional controls) should continue for each site. Data collected from LTM activities should be reviewed in the second five-year review cycle to ensure continued successful operation of the measures taken.

Based on review of data and current PRGs and toxicological data, it is recommended that ESDs be prepared to remove the commercial/industrial use restrictions from the DDs for Sites D5, O2, O3, T1, T2, T3, S8, and S9. BCT approval of these ESDs would result in removal of deed restrictions for these sites. This will result in decreasing the number of IRP sites included in the next five-year review. Also, as described in section 7.4, additional evaluation is necessary to determine if removal of the institutional control and deed restriction is warranted for Site C1.

10.0 Protectiveness Statement

As detailed in this report, the remedies selected for each of the sites have been reviewed for their level of effectiveness in protecting human health and the environment. Measures taken at the sites are as follows:

Site R2 in Parcel A	Institutional controls and long-term monitoring
Parcel B	Institutional controls and long-term monitoring
Sites C7 and D1 in Parcel E	Institutional controls, soil removal, and long-term monitoring
Site C1 in Parcel E	Institutional controls, sediment removal, and site controls.

This five-year review demonstrates that the measures have been effective for protection of human health and the environment. Long-term protectiveness of the remedial action will be verified by obtaining additional groundwater samples as part of the selected remedial measures. These data will be used in subsequent five-year reviews to fully evaluate potential migration of the contaminant plume. Available data reviewed as part of this review indicated little change in contaminant concentrations or extent of contamination.

11.0 Next Review

The next review for this site is May 2008, five years from the date of this review.

ATTACHMENT 1

List of Documents Reviewed

Innovative Technical Solutions, Inc., Final Remedial Action Site Summary Report, Gentile Air Force Station, Parcel E Soil Removal Action Project, January 2003.

Jacobs Engineering Group, Decision/Closure Document for No Further Action, Installation Restoration Program, Remedial Actions at Various Sites, Gentile AFS, Final, March 1997.

Jacobs Engineering Group, Summary Report for the Site C1 Removal Action, Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio, Draft Final, July 2000.

Jacobs Engineering Group, Inc., Summary Report for the Site D1 Removal Action, Gentile Air Force Station, August 2000.

URS Greiner, Phase I Remedial Investigation, Volume I, Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio, Final, November 1996.

URS Greiner, Site and Risk Characterization for Parcel A at Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio, Final, March 1997.

URS Greiner, Phase II Remedial Investigation Report, Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio, May 1997.

URS Greiner, Revised Engineering Evaluation/Cost Analysis, Site C1, Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio, Final, September 1999.

URS Greiner, Supplemental Remedial Investigation for Parcel B, Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio, Draft Final, December 1999.

URS Consultants, Supplemental Remedial Investigation for Parcel E and Base-Wide Background Characterization Report, Volume I, Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio, Final, October 2000.

URS Greiner, Focused Feasibility Study Report for Parcel E, Volume II, Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio, Draft Final, June 2001.

U.S. Air Force, Stationwide Environmental Baseline Survey, Gentile Air Force Station, Ohio, Final, April 1996.

U.S. Air Force, Decision Document, Site R2 Floor Drain to Infiltration Pit at Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio, Final, September 1997.

U.S. Air Force, Decision Document, Parcel B Soils at Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio, Final, March 1999.

U.S. Air Force, Decision Document, Parcel B Groundwater at Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio, Final, September 2000.

U.S. Air Force, Supplemental Environmental Baseline Survey, Parcel B, Gentile Air Force Station, Kettering, Ohio, Final, September 2001.

U.S. Air Force, Decision Document, Sites C7 and D1 within Parcel E at Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio, Final, July 2002.

U.S. Air Force, Decision Document, Site C1 within Parcel E at Defense Electronics Supply Center, Gentile Air Force Station, Kettering, Ohio, Final, July 2002.

U.S. Environmental Protection Agency, Soil Screening Guidance, U.S. Environmental Protection Agency, Washington, DC, EPA/540/R-95/128, May 1996.

U.S. Environmental Protection Agency, Trichloroethylene Health Risk Assessment: Synthesis and Characterization, Office of Research and Development, U.S. Environmental Protection Agency, Washington, D.C., August 2001.

U.S. Environmental Protection Agency, Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment), Draft, September 2001.

U.S. Environmental Protection Agency, Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils, Office of Research and Development, U.S. Environmental Protection Agency, Washington, D.C., EPA530-F-02-052, November 2002.

U.S. Environmental Protection Agency, Region III Risk-Based Concentration Table, Philadelphia, PA, April 25, 2003.

U.S. Environmental Protection Agency, Integrated Risk Information System (IRIS), On-Line Database, 2003.

U.S. Environmental Protection Agency, Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings. Three-Phase System Models and Soil Gas Models, On-line Spreadsheets, U.S. Environmental Protection Agency, Washington, DC, Revised June 2003.

ATTACHMENT 2

PUBLIC NOTICE - CERCLA FIVE-YEAR REVIEW and
RESTORATION ADVISORY BOARD MEETING
GENTILE AIR FORCE STATION
KETTERING, OH

The United States Air Force Real Property Agency (AFRPA) is providing notice to conduct the first CERCLA Five-Year Review of the selected remedies that are being implemented at the former Gentile AFS. The purpose of the review is to determine if the ongoing remedies at Gentile are or will be protective of human health and the environment upon their completion. The community is invited to the Restoration Advisory Board (RAB) Meeting to ask questions or provide comments and learn more about the Five-Year Review on August 20, 2003 at 7:00 pm at the City of Kettering Government Center at 3600 Shroyer Road. A summary of the Five-Year Review findings will be presented at the meeting.

A copy of the CERCLA Five-Year Review Report will be added to the Administrative Record at the former Gentile AFS as well as the Information Repository located in the Kettering Public Library, Wilmington-Stroop Branch, 3980 Wilmington Pike, Kettering, Ohio.

Individuals interested in reviewing the information at Gentile should contact:

John Fringer
AFRPA/DB Gentile
1700 North Moore Street, Suite 2300
Arlington, VA 22209-2802
(703) 696-5573

Table 1
Gentile 5 Year Review Summary

Site	Parcel	Description	DD Date	Contaminants of Concern	Initial Response Actions	Remedy	In Five Year Review?	Comments
Sites with remedial actions								
D2	B	Disposal Area No. 2	Sep-00	VOCs	Transport modeling and risk assessment	Institutional controls	Yes - Part of Parcel B	DD GW monitoring does not show any change in concentration or extent of contaminants.
M1	B	Hydraulic Lift in Motor Pool	Sep-00	VOCs	Transport modeling and risk assessment	Institutional controls	Yes - Part of Parcel B	DD GW monitoring does not show any change in concentration or extent of contaminants.
M7	B	Base Civil Engineering Storage-B	Sep-00	VOCs	Transport modeling and risk assessment	Institutional controls	Yes - Part of Parcel B	DD GW monitoring does not show any change in concentration or extent of contaminants.
R1	B	Wash Rack Draining into Creek	Sep-00	VOCs	Transport modeling and risk assessment	Institutional controls	Yes - Part of Parcel B	DD GW monitoring does not show any change in concentration or extent of contaminants.
S1	B	Coal Storage Area - Building 17	Sep-00	VOCs	Transport modeling and risk assessment	Institutional controls and long-term monitoring	Yes - Part of Parcel B	DD GW monitoring does not show any change in concentration or extent of contaminants.
S3	B	Pesticide Storage - Building 80	Sep-00	VOCs	Transport modeling and risk assessment	Institutional controls	Yes - Part of Parcel B	DD GW monitoring does not show any change in concentration or extent of contaminants.
C1	E	West Branch of Little Beaver Creek	Jul-02	PAHs, pesticides, and metals	Dredging the Creek	Institutional Controls/Site Controls	Yes	Portions of the drainage area not part of facility property.
C7	E	Loop Storage Yard	Jul-02	VOCs	None	Institutional controls and long-term monitoring	Yes	
D1	E	Disposal Area No. 1	Jul-02	VOCs	Excavation of the disposal area	Institutional controls and long-term monitoring	Yes	
R2	A	Floor Drain to Infiltration Pit	Apr-97	cis-DCE, and trans-DCE	None	Institutional controls and long-term monitoring	Yes	GW Monitoring indicates decreasing conc. of COCs.
Sites closed with NFRAP with restrictions								
C2A	A	Rail Lines	Jan-97	PAHs	Rail lines removed in 1982. Areas asphalt or gravel surfaced.	Conditional NFRAP	Yes	NFRAP based on results of risk assessment for general workers and construction workers.
D5	A	Electronic Tube Storage Area	Apr-97	radiological contaminants	None	Conditional NFRAP	Yes	No contaminants detected. Recommend issuing a Explanation of Significant Difference to remove any use restrictions.
M2	A	Transformer Failure Area	Jan-97	PCBs	Gravel removed, concrete removed and cleaned.	Conditional NFRAP	Yes	PCBs < 25 mg/kg. 40 CFR 761.125(c)(3). Criteria for controlled areas.
M3	A	Waste Oil Feed Area	Jan-97	Methylene chloride, phthalates, PAHs	UST removed in 1982 and area paved.	Conditional NFRAP	Yes	Contaminant conc. compared to Reg 3 RBSC for industrial exposures
M4	A	Compressor Room	Jan-97	PAHs, phthalates, metals	None	Conditional NFRAP	Yes	Contaminant conc. compared to Reg 3 RBSC for industrial exposures
O1	A	Paint Drain Line	Apr-97	PAHs, VOCs	OWS 7 and contaminated soil removed 10/96.	Conditional NFRAP	Yes	Contaminant conc. compared to Region IX PRG industrial soil
O2	B	Oil/Water Separators	Apr-97	PAHs, VOCs	OWS 1, 2, & 3 and contaminated soil removed 11/96.	Conditional NFRAP	Yes	Contaminant conc. compared to Region IX PRG industrial soil. Review against current standards indicates unrestricted use is acceptable. Recommend issuing a Explanation of Significant Difference to remove any use restrictions
O3	A	Oil/Water Separator and Drain	Apr-97	PAHs, VOCs	OWS 4, 5, & 6 and contaminated soil removed 10/96.	Conditional NFRAP	Yes	Contaminant conc. compared to Region IX PRG industrial soil. Review against current standards indicates unrestricted use is acceptable. Recommend issuing a Explanation of Significant Difference to remove any use restrictions
O4	A	Oil/Water Separator	Apr-97	PAHs, VOCs	OWS 8 and contaminated soil removed 10/96.	Conditional NFRAP	Yes	Contaminant conc. compared to Region IX PRG industrial soil
R3	A	Wash Rack	Jan-97	Benzene, toluene, PAHs	Wash rack removed?	Conditional NFRAP	Yes	Contaminant conc. compared to Reg 3 RBSC for industrial exposures
S4	B	Herbicide Storage	Apr-97	Pesticides, herbicides, PAHs	Building removed	Conditional NFRAP	Yes	Risk assessment based on construction worker scenario
S5	A	PCB Storage Area	Jan-97	PCBs	Concrete surfaces cleaned in 10/96	Conditional NFRAP	Yes	PCBs<10ug/100cm ² 40 CFR 761.125(c)(3) - Criteria for controlled areas.
S7	A	Chemical Storage	Jan-97	PAHs, metals	None?	Conditional NFRAP	Yes	Contaminant conc. compared to RBSC for industrial exposure.
S8	A	PCB Storage Area	Apr-97	PCBs	None	Conditional NFRAP	Yes	PCBs < industrial and residential RBSC. Review against current standards indicates unrestricted use is acceptable. Recommend issuing a Explanation of Significant Difference to remove any use restrictions
S9	F	Instrument Calibration Area	Jan-97	radiological contaminants	None	Conditional NFRAP	Yes	Radiological survey showed no presence of Cobalt 60. Recommend issuing a Explanation of Significant Difference to remove any use restrictions
T1	F	Hydrofluoric Acid Catch Basin	Apr-97	PAHs, VOCs	OWS 10 and contaminated soil removed 11/96.	Conditional NFRAP	Yes	Contaminant conc. compared to Region IX PRG industrial soil. Review against current standards indicates unrestricted use is acceptable. Recommend issuing a Explanation of Significant Difference to remove any use restrictions
T2	A	Acid Neutralizing Tank	Apr-97	PAHs, VOCs	OWS 11 and contaminated soil removed 10/96.	Conditional NFRAP	Yes	Contaminant conc. compared to Region IX PRG industrial soil. Review against current standards indicates unrestricted use is acceptable. Recommend issuing a Explanation of Significant Difference to remove any use restrictions
T3	F	Acid Neutralizing Sump	Apr-97	PAHs, VOCs	OWS 9 and contaminated soil removed 11/96.	Conditional NFRAP	Yes	Contaminant conc. compared to Region IX PRG industrial soil. Review against current standards indicates unrestricted use is acceptable. Recommend issuing a Explanation of Significant Difference to remove any use restrictions
Sites closed with NFRAP								
C2E	E	Rail Lines	Jun-02			NFRAP based on unrestricted use	No	
C5	E	Howitzer Spill Site	Jan-97			NFRAP based on unrestricted use	No	
C6	C	Former Water Tower	Jun-03	Lead	None	NFRAP based on unrestricted use	Yes	Lead in soil in excess of residential RBSC, less than RBSC derived for industrial exposure. Based on further evaluation of potential residential exposures to lead, an ESD was issued on June 5, 2003 stating that lead in soil does not pose an unacceptable risk to human health. Deed restrictions removed.
D4	E	Disposal Area No. 4	Dec-02			NFRAP based on unrestricted use	No	Deed restrictions removed in 12/02
M5	A	Staining in Shop Area	Jan-97			NFRAP based on unrestricted use	No	
M6	A	Floor Stains	Jan-97			NFRAP based on unrestricted use	No	
S2	E	Reserve Coal Storage Area	Aug-02			NFRAP based on unrestricted use	No	
S6	B	Paint Storage Area	Jan-97			NFRAP based on unrestricted use	No	
C3	E	Small Arms Skeet Range	Nov-01			NFRAP based on residential use	No	
C4	E	Railroad Parcel	Nov-01			NFRAP based on residential use	No	
C8	E	Southern Storage Yard	Jul-01			NFRAP based on residential use	No	
D3	E	Disposal Area No. 3	Jul-01			NFRAP based on residential use	No	

Notes: Conditional NFRAP - Sites used NFRAP with condition that site maintain the industrial/commercial use

Table 2
Chronology of Events
Site R2 in Parcel A
Five-Year Review
Gentile AFS, Ohio

Event	Date
Install generators and infiltration pit	1973-1974
Stationwide Environmental Baseline Survey	August 1994
Black staining observed in the pit	November 1994
Phase I Remedial Investigation (RI)	1996
Building 73 demolished – remove floor drain and infiltration pit	January 1997
Phase II RI	1997
Proposed remedial plan made available to the public	April 1997
Decision Document selecting final remedy is signed	May 1997
Parcel A transferred to the City of Kettering	August 1997
Groundwater investigation to define the nature and extent	1998
Long-term monitoring started	August 1998
Reduce monitoring frequency from quarterly to semi-annually	November 2001

Table 3
Chronology of Events
Parcel B
Five-Year Review
Gentile AFS, Ohio

Event	Date
Portion of Parcel B (IRP Site S1) used for coal storage	1945-1996
Waste oil disposal on the coal pile	Prior to 1978
Stationwide Environmental Baseline Survey	August 1994
Phased RI	1996-1999
Decision Document for soils signed	April 1999
Statement of Basis/Final Decision for soils signed	September 1999
Parcel B Supplemental Remedial Investigation (SRI)	December 1999
Hydrologic testing for remedial design	June 2000
Decision Document for groundwater signed	July 2000
Explanation of Significant Difference issued	September 2000
Groundwater remedial action report	October 2000
Long-term monitoring started	February 2001
Reduce monitoring frequency from quarterly to semi-annually	November 2001

Table 4
Chronology of Events
Sites C7 and D1 in Parcel E
Five-Year Review
Gentile AFS, Ohio

Event	Date
Site D1	
Area used as a disposal area	1950s
Pre-RI site investigations	1988-1995
Phase I RI	1995-1996
Phase II RI	1996 - 1997
Geophysical survey completed	1998
Disposal D1 area removed	November 1999
Site C7	
Area used as a storage area	
Sites D1 and C7	
Supplemental RI	1999 - 2000
Focused Feasibility Study	2000 - 2001
Excavation and soil removal	Aug – Sep 2002
Decision Document signed	July 2002
Long-term monitoring started	October 2002

Table 5
Chronology of Events
Site C1 in Parcel E
Five-Year Review
Gentile AFS, Ohio

Event	Date
Phase I RI	1995-1997
Phase II RI	1997
Supplemental RI	1997
Engineering Evaluation/Cost Analysis	2000
Removal action	2000
Decision Document signed	July 2002

Table 6
Removal Action and Decision Document Dates
Conditional NFRAP Sites
Five-Year Review
Gentile AFS, Ohio

IRP Site	Date of Removal Actions	Final Decision Date
C2	1982	April 17, 1997
D5	None	April 17, 1997
M2	1995	January 23, 1997
M3	1982	January 23, 1997
M4	1996	January 23, 1997
O1	October 1996	April 17, 1997
O2	November 1996	April 17, 1997
O3	October 1996	April 17, 1997
O4	October 1996	April 17, 1997
R3	None	January 23, 1997
S4	None	April 17, 1997
S5	October 1996	January 23, 1997
S7	None	January 23, 1997
S8	None	April 17, 1997
S9	None	January 23, 1997
T1	November 1996	April 17, 1997
T2	October 1996	April 17, 1997
T3	November 1996	April 17, 1997

Table 7
Land Uses
Conditional NFRAP Sites
Five-Year Review
Gentile AFS, Ohio

IRP Site	Former Use	Future Use
C2	Rail Line	Parking Lot
D5	Electron Tube Disposal Area	Parking Lot
M2	Transformer and pad	Transformer and pad
M3	Waste Oil Feed Area	Parking Lot
M4	Compressor Room	Compressor Room
O1	Oil Water Separator 7	Parking area
O2	Oil Water Separator 1, 2, & 3	Parking Lot
O3	Oil Water Separator 4, 5, & 6	Parking Lot
O4	Oil Water Separator 8	Parking Lot
R3	Wash Rack	Parking Lot
S4	Herbicide Storage	Parking Lot
S5	PCB Storage Area	Inside building
S7	Chemical Storage Area	
S8	PCB Storage Area	Parking Lot
S9	Instrument Calibration Area	Inside building
T1	Oil Water Separator 10	Landscaped area
T2	Oil Water Separator 11	Parking Lot
T3	Oil Water Separator 9	Inside building

Table 8
Contaminants of Concern
Conditional NFRAP Sites
Five-Year Review
Gentile AFS, Ohio

IRP Site	Description	Contaminants of Concern
C2	Rail Line	PAHs
D5	Electron Tube Disposal Area	Radiological constituents
M2	Transformer and pad	PCBs
M3	Waste Oil Feed Area	Methylene chloride, phthalates, metals
M4	Compressor Room	PAHs, phthalates, metals
O1	Oil Water Separator 7	PAHs, VOCs
O2	Oil Water Separator 1, 2, & 3	PAHs, VOCs
O3	Oil Water Separator 4, 5, & 6	PAHs, VOCs
O4	Oil Water Separator 8	PAHs, VOCs
R3	Wash Rack	Benzene, toluene, PAHs
S4	Herbicide Storage	Pesticides, herbicides, PAHs
S5	PCB Storage Area	PCBs
S7	Chemical Storage Area	PAHs, metals
S8	PCB Storage Area	PCBs
S9	Instrument Calibration Area	Radiological constituents
T1	Oil Water Separator 10	PAHs, VOCs
T2	Oil Water Separator 11	PAHs, VOCs
T3	Oil Water Separator 9	PAHs, VOCs

Table 9
Initial Response Actions
Conditional NFRAP Sites
Five-Year Review
Gentile AFS, Ohio

IRP Site	Description	Initial Response Action
C2	Rail Line	Rail lines removed in 1982. Areas resurfaced with asphalt or gravel
D5	Electron Tube Disposal Area	None
M2	Transformer and pad	Gravel remove. Concrete cleaned and removed.
M3	Waste Oil Feed Area	1982 UST removed. Area paved.
M4	Compressor Room	None
O1	Oil Water Separator 7	October 1996 - OWS 7 removed, contaminated soil removed, and Area Restored
O2	Oil Water Separator 1, 2, & 3	November 1996 - OWS 1, 2, & 3 removed, contaminated soil removed, and area restored
O3	Oil Water Separator 4, 5, & 6	October 1996 - OWS 4, 5, & 6 removed, contaminated soil removed, and area restored
O4	Oil Water Separator 8	October 1996 - OWS 8 removed, contaminated soil removed, and area restored
R3	Wash Rack	Wash rack removed
S4	Herbicide Storage	Building removed
S5	PCB Storage Area	October 1996 - Concrete surfaces cleaned.
S7	Chemical Storage Area	None
S8	PCB Storage Area	None
S9	Instrument Calibration Area	None
T1	Oil Water Separator 10	November 1996 - OWS 10 removed, contaminated soil removed, and area restored
T2	Oil Water Separator 11	October 1996 - OWS 11 removed, contaminated soil removed, and area restored
T3	Oil Water Separator 9	October 1996 - OWS 9 removed, contaminated soil removed, and area restored

Table 10
Basis for Taking Action
Conditional NFRAP Sites
Five-Year Review
Gentile AFS, Ohio

IRP Site	Contaminants of Concern	Criteria
C2	PAHs	
D5	Radiological constituents	No contamination detected
M2	PCBs	40 CFR 761.125(c)(3)
M3	Methylene chloride, phthalates, metals	Risk based screening criteria for occupational exposures
M4	PAHs, phthalates, metals	Risk based screening criteria for occupational exposures
O1	PAHs, VOCs	Region IX PRGs – industrial use scenario.
O2	PAHs, VOCs	Region IX PRGs – industrial use scenario.
O3	PAHs, VOCs	Region IX PRGs – industrial use scenario.
O4	PAHs, VOCs	Region IX PRGs – industrial use scenario.
R3	Benzene, toluene, PAHs	Risk based screening criteria for occupational exposures
S4	Pesticides, herbicides, PAHs	Risk assessment – construction worker scenario
S5	PCBs	40 CFR 761.125(c)(3)
S7	PAHs, metals	Risk based screening criteria for industrial exposures
S8	PCBs	40 CFR 761.125(c)(3)
S9	Radiological constituents	No contamination detected
T1	PAHs, VOCs	Region IX PRGs – industrial use scenario.
T2	PAHs, VOCs	Region IX PRGs – industrial use scenario.
T3	PAHs, VOCs	Region IX PRGs – industrial use scenario.

Table 11
Decision Dates
Conditional NFRAP Sites
Five-Year Review
Gentile AFS, Ohio

IRP Site	Description	Final Decision Date
C2	Rail Line	April 17, 1997
D5	Electron Tube Disposal Area	April 17, 1997
M2	Transformer and pad	January 23, 1997
M3	Waste Oil Feed Area	January 23, 1997
M4	Compressor Room	January 23, 1997
O1	Oil Water Separator 7	April 17, 1997
O2	Oil Water Separator 1, 2, & 3	April 17, 1997
O3	Oil Water Separator 4, 5, & 6	April 17, 1997
O4	Oil Water Separator 8	April 17, 1997
R3	Wash Rack	January 23, 1997
S4	Herbicide Storage	April 17, 1997
S5	PCB Storage Area	January 23, 1997
S7	Chemical Storage Area	January 23, 1997
S8	PCB Storage Area	April 17, 1997
S9	Instrument Calibration Area	January 23, 1997
T1	Oil Water Separator 10	April 17, 1997
T2	Oil Water Separator 11	April 17, 1997
T3	Oil Water Separator 9	April 17, 1997

Table 12
Land Transfer Records
Gentile AFS
Kettering, Ohio
Page 1 of 2

PARCEL	DATE	SIZE (ACRES)	DEED REFERENCE	MICRO- FICHE NO.	PLAT REFERENCE	DEVELOPMENT		DEED RESTRICTIONS AND COVENANTS
A	10/07 1997	75.182	97-021020 USA to City of Kettering	97-00676 C01	Plat Book 170, page 1 and 1A	Platted as Kettering Business Park, Section One, con- taining 56.923 ac. Divided into Lot Nos. 1 and 2	Lot 1 - @ 11.642 Unsold	Right of Access Covenants: Groundwater restrictions; CERCLA notice of former storage and/or disposal of hazardous substances
							Lot 2 @ 10.793 ac 2/13/98 - PNC Bank Deed 98- 002942; Microfiche 98- 00096-C01	Right of Access Covenants: Acknowledgement of receipt of AF Deed and aware of former storage and/or disposal of hazardous substances under CERCLA
B	04/19 2001	11.332	01-041233 USA to City of Kettering	01-254 A12	Plat Book 182, page 22 and 22A	Platted as Kettering Business Park, Section Two, Lot No. 1, containing 10.793 ac	Lot 1 - Unsold	Right of Access Covenants: Soil contamination and use restrictions (permission for residential/child care); Groundwater restrictions; CERCLA notice of former storage and/or disposal of hazardous substances
C	10/26 1998	13.017	98-023827 USA to City of Kettering	98-00724 B09	Plat Book 183, page 33 and 33A	Platted as Kettering Business Park, Section Four, containing 15.899 acres. Divided into Lot Nos. 1 and 2	Lot 1 @ 3.129 ac Unsold	Right of Access Covenants: Use restriction (only industrial and/or commercial); CERCLA notice of no hazardous substances exceeding RQ stored, released, and/or disposed
							Lot 2 @ 12.770 ac Unsold	
C-1	02/12 2001	2.858	01-014009 USA to City of Kettering	01-89 D12				Right of Access Covenants: Wastewater discharge permit will be obtained; CERCLA notice of no hazardous substances exceeding RQ stored, released, and/or disposed

Table 12
Land Transfer Records
Gentile AFS
Kettering, Ohio
Page 2 of 2

PARCEL	DATE	SIZE (ACRES)	DEED REFERENCE	MICRO- FICHE NO.	PLAT REFERENCE	DEVELOPMENT		DEED RESTRICTIONS AND COVENANTS
D	11/03 1997	19.505	97-023087 USA to City of Kettering and 97-925985 USA to City of Kettering	97-00741 B12 and 97-00839 C05	Plat Book 185, Pages 13, 13A, and 13B Total includes 13.738 ac from Parcel A	Platted as Kettering Business Park, Section Five, containing 33.486 acres. Divided into Lots No. 1, 2, 3, 4, and 5.	Lot 1 @ 5.678 ac 12/11/97 – National Center for Composite Systems Deed 97-025985 Microfiche 97- 00830 C05	Refers to conditions and restrictions of record; rights of access/rights of use/ all covenants in USA deed. USA deed incorporated and attached to this deed.
							Lot 2 @ 9.276 ac Unsold	Right of Access Covenants: Groundwater restrictions; CERCLA notice of no hazardous substances or petroleum products stored, released, or disposed
							Lot 3 @ 2.781 ac Unsold	
							Lot 4 @ 2.631 ac Unsold	
							Lot 5 @ 8.281 ac Unsold	
E	Parcel E has not been transferred to the City of Kettering at this time.							Proposed Deed Restrictions: Right of Access; Groundwater restrictions; CERCLA notice of former storage and/or disposal of hazardous substances
F	05/14 1999	16.803	99-048644 USA to City of Kettering	99-305 D01	Plat Book 183, page 32 and 32A	Platted as Kettering Business Park, Section Three, containing 16.803 acres. Divided into Lot No. 1 and 2	Lot 1 @ 4.424 ac	Right of Access Covenants: Wastewater permit will be obtained; CERCLA notice of no hazardous substances exceeding RQ stored, released, and/or disposed
							Lot 2 @ 12.379 ac	

Table 13
Detected VOCs in Groundwater
Through May 2000
Site R2 -
Gentile AFS, Kettering, Ohio

Parameter	R2MW02													
	W1 µg/L 02/15/96	W2 µg/L 10/01/96	W3 µg/L 05/05/97	W4 µg/L 08/12/97	W5 µg/L 11/13/97	W6 µg/L 02/24/98	W7 µg/L 08/26/98	W8 µg/L 11/19/1998	W9/R2Dup3 µg/L 2/25/1999	W10 µg/L 5/27/1999	W11 µg/L 8/4/1999	W12 µg/L 11/10/1999	W13 µg/L 2/16/2000	W14/R2Dup8 µg/L 5/18/2000
1,1-Dichloroethane	50 U	25 U	16 J	5.0 U	12 U	10 U	1 U	1 U	1 U	100 U	1 U	1 U	25 U	1 U 1 U
Benzene	U	U	U	U	U	U	U	U	U U	U	U	U	U	U U
cis-1,2-Dichloroethylene	1,900	2,500	2,100	380	770	590	960	510	120 J 120 J	1400	760	1100	250	280 J 270 J
trans-1,2-Dichloroethylene	21 J	32	27	4.5 J	9.5 J	8.1 J	16	11	8 8	100 U	12	18	25 U	5 J 5 J
Tetrachloroethylene	50 U	25 U	25 U	5.0 U	12 U	10 U	1 U	1 U	1 U 1 U	100 U	1 U	1 U	25 U	1 U 1 U
Trichloroethylene	50 U	25 U	25 U	5.0 U	12 U	10 U	0.9 J	0.7 J	0.6 J 0.6 J	100 U	0.9 J	1	25 U	1 U 1 U
Toluene	50 U	25 U	25 U	5.0 U	12 U	10 U	1 U	0.5 J	1 U 1 U	100 U	1 U	0.6 J	25 U	1 U 1 U
Vinyl Chloride	50 U	25 U	25 U	5.0 U	12 U	10 U	1	0.9 J	0.7 J 0.7 J	100 U	1	2	25 U	1 U 1 U
Methylene Chloride	50 U	25 U	25 U	5 U	12 U	10 U	1 U	2.0 U	1 U 1 U	210 U	1 U	0.8 J	25 U	1 U 1 U

Parameter	R2MW03								R2MW04							
	W1/R2Dup1 µg/L 8/26/1998	W2 µg/L 11/16/1998	W3 µg/L 2/25/1999	W4 µg/L 5/24/1999	W5/R2Dup5 µg/L 8/4/1999	W6 µg/L 11/9/1999	W7 µg/L 2/15/2000	W8 µg/L 5/17/2000	W1 µg/L 08/25/98	W2 µg/L 11/16/1998	W3 µg/L 2/25/1999	W4/R2Dup4 µg/L 5/27/1999	W5 µg/L 8/4/1999	W6 µg/L 11/10/1999	W7 µg/L 2/15/2000	W8 µg/L 5/17/2000
1,1-Dichloroethane	1 U 1 U	1 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	1 U
Benzene	U U	U	U	U	U U	U	U	U	U	U	U	U	U	U	U	U
cis-1,2-Dichloroethylene	1 U 1 U	1 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	36 J	44	65 J	50 63	66	75	80	46
trans-1,2-Dichloroethylene	1 U 1 U	1 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	2	3	4	12 13	6	4	3	3
Tetrachloroethylene	13 J 22 J	1 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	83	4	2 J	3 3	1	2	2	1 U
Trichloroethylene	3 J 5 J	1 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	21 J	2	2	3 3	2	2	1	0.9 J
Toluene	1 U 1 U	1 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	1 U
Vinyl Chloride	1 U 1 U	1 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	1 U
Methylene Chloride	1 U 1 U	2.0 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	1 U	1 U	0.9 J	1 U 1 U	1 U	0.5 J	1 U	1 U

Parameter	R2MW05								R2MW06							
	W1 µg/L 08/25/98	W2 µg/L 11/16/1998	W3 µg/L 2/22/1999	W4 µg/L 5/27/1999	W5 µg/L 8/3/1999	W6/R2Dup6 µg/L 11/9/1999	W7 µg/L 2/15/2000	W8 µg/L 5/18/2000	W1 µg/L 08/31/98	W2/R2Dup2 µg/L 11/20/1998	W3 µg/L 2/23/1999	W4 µg/L 5/25/1999	W5 µg/L 8/4/1999	W6 µg/L 11/10/1999	W7 µg/L 2/16/2000	W8 µg/L 5/18/2000
1,1-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	1 U	1 U	1 U
Benzene	U	U	U	U	U	U U	U	U	U	U U	U	U	U	U	U	U
cis-1,2-Dichloroethylene	2 J	2	1 J	1	1	1 J	0.6 J	1	1 J	0.6 J 0.6 J	0.8 J	1	0.7 J	0.7 J	1 U	1 U
trans-1,2-Dichloroethylene	1 U	1 U	1 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethylene	1 U	1 U	1 U	1 U	1 U	1 U 1 U	1 U	1 U	8	1 U 1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethylene	1 U	1 U	1 U	1 U	1 U	1 U 1 U	1 U	1 U	2 J	1 U 1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	0.5 J	1 U	1 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl Chloride	1 U	1 U	1 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methylene Chloride	1 U	2 U	1 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	1 U 1 U	1 U	1 U	1 U	1 U	1 U	1 U

Parameter	R2MW07								R2MW08				
	W1 µg/L 08/24/98	W2 µg/L 11/16/1998	W3 µg/L 2/22/1999	W4 µg/L 5/24/1999	W5 µg/L 8/3/1999	W6 µg/L 11/9/1999	W7 µg/L 2/15/2000	W8 µg/L 5/17/2000	W1 µg/L 5/24/1999	W2 µg/L 8/3/1999	W3 µg/L 11/9/1999	W4/R2Dup7 µg/L 2/15/2000	W5 µg/L 5/17/2000
1,1-Dichloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U 1 U	1 U
Benzene	U	U	U	U	U	U	U	U	U	U	U	U U	U
cis-1,2-Dichloroethylene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 J	1	2	1 1	1 U
trans-1,2-Dichloroethylene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U 1 U	1 U
Tetrachloroethylene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U 1 U	1 U
Trichloroethylene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U 1 U	1 U
Toluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U 1 U	1 U
Vinyl Chloride	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U 1 U	1 U
Methylene Chloride	1 U	2 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U 1 U	1 U

J = Estimated concentration because the result was below the reporting limit and/or quality control criteria were not met.
U = The compound was analyzed for but not detected. Value shown is the reporting limit.
F = The compound was positively identified but the associated numerical value is below the reporting limit.
U = The compound was analyzed for but not detected. The reporting limit is estimated.
NT = Not a target analyte.

Table 14
Detected VOCs In Groundwater
R2 Long Term Monitoring Program
Gentile AFS, Kettering, Ohio
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First 5-Yr Review
Gentile AFS
June 2004

LOCATION	DATE	1,1-DCA	benzene	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	toluene	vinyl chloride	methylene chloride
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
MCL		---	5	70	100	5	5	1000	2	---
R2MW02	8/30/2000	1 U	1 U	610.00	11.00	1 U	0.85 J	1 U	1 U	1 U
	11/29/2000	1 U	1 U	510.00	8.25	1 U	1 U	1 U	1 U	1.99 U
	2/12/2001	1 U/ 1 U	1 U/ 1 U	383 J/236 J	9.35 J/ 5.91 J	1 U/ 1 U	0.56 F/ 10 U	1 U/ 1 U	1 U/ .75 F	1 U/ 1 U
	11/15/2001	1 U	1 U	107.00	4.60	1 U	1 U	1 U	1 U	1 U
	5/15/2002	1 U/ 1 U	1 U/ 1 U	147/140	7.95=/7.43	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U
	11/7/2002	1 U	1 U	92.40	4.24	1 U	1 U	1 U	1 U	1 U
	5/16/2003	1 U/ 1 U	1 U/ 1 U	104/99.4	4.48/ 4.20	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U
R2MW03	8/30/2000	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U
	11/29/2000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.82 U
	2/12/2001	1 U	1 U	0.22 F	1 U	1 U	1 U	1 U	1 U	1 U
	11/15/2001	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	5/15/2002	1 U	0.183 F	1 U	1 U	1 U	1 U	0.535 F	1 U	1 U
	11/6/2002	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	5/16/2003	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
R2MW04	8/30/2000	1 U	1 U	55.00	3.03	0.831 J	1.05	1 U	1 U	1.5 U
	11/29/2000	1 U	1 U	38.00	3.14	1 U	1.44	1 U	1 U	1.3 U
	2/12/2001	1 U	0.41 F	51.30	2.52	1.20	0.79 F	1 U	1 U	1 U
	11/14/01	1 U	1 U	69.00	4.24	2.14	2.07	1 U	1 U	1 U
	5/15/2002	1 U	1 U	54.8 J	3.43	1.11	1.92	1 U	1 U	1 U
	11/6/2002	1 U	1 U	71.1 J	3.92	0.861	2.12	1 U	1 U	1 U
	5/16/2003	1 U	1 U	59.00	3.18	1 U	0.544	1 U	1 U	1 U
R2MW05	8/30/2000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	11/29/2000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2.48 U
	2/12/2001	0.5 U	0.5 U	0.47 F	0.6 U	1.4 U	1 U	1 U	1.1 U	2 U
	11/14/2001	1 U	1 U	0.45 F	1 U	1 U	1 U	1 U	1 U	1 U
	5/14/2002	1 U	1 U	0.378 F	1 U	1 U	1 U	1 U	1 U	1 U
	11/6/2002	1 U	1 U	0.559 J	1 U	1 U	1 U	1 U	1 U	1 U
	5/16/2003	1 U	1 U	0.699	1 U	1 U	1 U	1 U	1 U	1 U
R2MW06	8/30/2000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.942 U
	11/29/2000	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1.28 U
	2/12/2001	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	11/13/2001	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	5/14/2002	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	11/5/2002	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	5/16/2003	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
R2MW07	8/30/2000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.87 U
	11/29/2000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	11/29/2000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	2/12/2001	1.2 U	0.5 U	1.2 U	0.6 U	1.4 U	1 U	1.1 U	1.1 U	2 U
	11/13/2001	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	5/14/2002	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	11/5/2002	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	5/16/2003	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

Table 14
Detected VOCs In Groundwater
R2 Long Term Monitoring Program
Gentile AFS, Kettering, Ohio
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First 5-Yr Review
Gentile AFS
June 2004

LOCATION	DATE	1,1-DCA	benzene	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	toluene	vinyl chloride	methylene chloride
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
MCL		---	5	70	100	5	5	1000	2	---
R2MW08	8/30/2000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	11/29/2000	1 U	8.12	1.07	1 U	1 U	1 U	1 U	1 U	1 U
	2/12/2001	1 U	1 U	1.80	1 U	1 U	1 U	1 U	1 U	1 U
	11/14/2001	1 U	1 U	1.68	1 U	1 U	1 U	1 U	1 U	1 U
	5/14/2002	1 U	1 U	1.61	1 U	1 U	1 U	1 U	1 U	1 U
	11/6/2002	1 U/ 1 U	1 U/ 1 U	1.72 J/1.71 J	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U
	5/15/2003	1 U	1 U	1.60	1 U	1 U	1 U	1 U	1 U	1 U

DCA = Dichloroethane

PCE= Tetrachloroethylene

TCE = Trichloroethylene

DCE = Dichloroethylene

(ug/L)= micrograms/liter

0.56/ 0.54 = original sample result/ duplicate sample result

Definition of Lab Qualifiers

J = Estimated concentration because result was below the reporting limit and/or quality control criteria were not met.

U = The compound was analyzed for, but not detected. Value shown is the reporting limit.

F= The compound was positively identified but the associated numerical value is below the reporting limit.

MCL = maximum contaminant level

Concentrations in **bold** exceed the MCLs.

--- = No MCL available

Table 15
Detected VOCs and Metals in Groundwater
Supplemental Remedial Investigation for Parcel B
Through March 2000
Gentile AFS, Kettering, Ohio
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Parameter	Maximum Contaminant Level	SIMW01							SIMW02					
					Reg / Dup			Reg / Dup						
		2/13/1996	11/13/1996	8/28/1998	11/19/1998	2/24/1999	05/26/99	3/22/2000	2/13/1996	11/13/1996	8/27/1998	11/19/1998	2/24/1999	05/27/99
VOCs in µg/L														
1,1,1-Trichloroethane	200	1.5	2.2	3	5 / 4	2	6	1 / 2	0.84 J	0.69 J	2	2	2	2
1,1-Dichloroethane	---	0.61 J	0.49 J	1 U	1 / 1	0.7 J	2	0.8 J/0.8 J	1.0 U	0.12 J	0.8 J	1	0.5 J	0.9 J
1,2,3-Trichlorobenzene	---	1.0 U	1.0 U	1 UJ	1 U/1 U	1 UJ	1 U	1 U/1 U	1.0 U	1.0 U	1 UJ	1 U	1 U	1 U
1,2,4-Trichlorobenzene	---	1.0 U	1.0 U	1 U	1 U/1 U	1 UJ	1 U	1 U/1 U	1.0 U	1.0 U	1 UJ	1 U	1 U	1 U
1,2,4-Trimethylbenzene	---	1.0 U	0.17 J	1 U	1 U/1 U	1 UJ	1 U	1 U/1 U	1.0 U	1.0 U	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	---	1.0 U	0.14 J	1 U	1 U/1 U	1 UJ	1 U	1 U/1 U	1.0 U	1.0 U	1 U	1 U	1 U	1 U
Benzene	5	1.0 U	1.0 U	1 U	1 U/1 U	1 UJ	1 U	1 U/1 U	1.0 U	1.0 U	1 U	1 U	1 U	1 U
Bromodichloromethane	100 ^(T)	1.0 U	0.49 J	2	1 J/1 J	0.6 J	1	1 U/1 U	1.0 U	1.0 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	5	0.78 J	1.7	1	2 / 2	1	2	0.6 J/0.9 J	0.30 J	1.0 U	1 U	1 U	1 U	1 U
Chloroform	100 ^(T)	0.46 J	3.4	5	4 / 4	2	4	1/0.8 J	0.17 J	1.0 U	1 U	1 U	1 U	1 U
Dibromochloromethane	100 ^(T)	1.0 U	1.0 U	1 U	1 U/1 U	1 U	1 U	1 U/1 U	1.0 U	1.0 U	1 U	1 U	1 U	1 U
Ethylbenzene	700	1.0 U	0.11 J	1 U	1 U/1 U	1 UJ	1 U	1 U/1 U	1.0 U	1.0 U	1 U	1 U	1 U	1 U
Methylene Chloride	---	1.0 U	1.0 U	1 UJ	3 U/1 U	1 U	1 UJ	1 UJ/1 UJ	1.0 U	1.0 U	1 U	1 U	1 U	1 UJ
Naphthalene	---	1.0 U	1.0 U	1 UJ	1 U/1 U	1 U	1 U	1 UJ/1 UJ	1.0 U	1 UJ	1 UJ	1 U	1 U	1 U
m,p-Xylene	10 ^(TX)	1.0 U	0.35 J	2 U	2 U/2 U	2 UJ	2 U	2 U/2 U	1.0 U	1.0 U	2 U	2 U	2 U	2 U
o-Xylene	10 ^(TX)	1.0 U	0.17 J	1 U	1 U/1 U	1 UJ	1 U	1 U/1 U	1.0 U	1.0 U	1 U	1 U	1 U	1 U
Tetrachloroethylene	5	4.6	6.3	34 J	20 / 17	11	33	1 U/14	1.0 U	1.0 U	3 J	1 U	1 U	1 U
Toluene	1000	1.0 U	0.20 J	1 U	1 U/1 U	1 UJ	1 U	0.6 J/0.7 J	1.0 U	1.0 U	1 U	1 U	1 U	1 U
Trichloroethylene	5	0.67 J	1.0 U	6	2 / 2	1	4	1 U/2	1.0 U	1.0 U	0.7 J	1 U	1 U	1 U
cis-1,2-Dichloroethylene	70	1.8	1.7	4	7 / 6	4	11	0.6 J/4	1.0 U	1.0 U	1 U	1 U	1 U	1 U
2-Butanone	---	NT	NT	NT	NT	6 J	2 U	NT	NT	NT	NT	NT	NT	2 U
Acetone	---	NT	NT	NT	NT	5 J	2 U	NT	NT	NT	NT	NT	NT	2 U
METALS in µg/L														
Aluminum	---	12700	NS	3830 J	NS	NS	NS	NS	1600	NS	664 J	NS	NS	NS
Arsenic	50	19	NS	5.0 UJ	NS	NS	NS	NS	5 U	NS	5.0 UJ	NS	NS	NS
Barium	2,000	390	NS	195	NS	NS	NS	NS	29	NS	28.8	NS	NS	NS
Cadmium	5	1 U	NS	4.3	NS	NS	NS	NS	1 U	NS	6.9	NS	NS	NS
Calcium	---	287000	NS	178000	NS	NS	NS	NS	371000	NS	232000	NS	NS	NS
Chromium	100	70 U	NS	70.0 U	NS	NS	NS	NS	70 U	NS	70.0 U	NS	NS	NS
Copper	1300*	60 U	NS	60.0 U	NS	NS	NS	NS	60 U	NS	60.0 U	NS	NS	NS
Iron	---	29700	NS	8560 J	NS	NS	NS	NS	3200	NS	3000	NS	NS	NS
Lead	15*	20	NS	10.7 J	NS	NS	NS	NS	5 U	NS	7.1 J	NS	NS	NS
Magnesium	---	110000	NS	69500	NS	NS	NS	NS	176000	NS	109000	NS	NS	NS
Manganese	---	1200	NS	605	NS	NS	NS	NS	440	NS	623	NS	NS	NS
Mercury	---	1 U	NS	0.26 U	NS	NS	NS	NS	1 U	NS	0.26 U	NS	NS	NS
Potassium	---	8500	NS	5000 U	NS	NS	NS	NS	10800	NS	5000 U	NS	NS	NS
Selenium	50	5 U	NS	5.0 UJ	NS	NS	NS	NS	7	NS	5.0 UJ	NS	NS	NS
Sodium	---	171000	NS	99900	NS	NS	NS	NS	149000	NS	87300	NS	NS	NS
Thallium	2	5 U	NS	2.0 U	NS	NS	NS	NS	5 U	NS	2.0 U	NS	NS	NS
Vanadium	---	80 U	NS	80 U	NS	NS	NS	NS	80 U	NS	80 U	NS	NS	NS
Zinc	---	140	NS	126	NS	NS	NS	NS	37	NS	80.7	NS	NS	NS

J = Estimated concentration because result was below the reporting limit and/or quality control criteria were not met.

U = The compound was analyzed for, but not detected. Value shown is the reporting limit.

UJ = The compound was analyzed for, but not detected. The reporting limit is estimated.

NA = Not analyzed

NS = Not sampled

T = Total Trihalomethane

TX = Total Xylene

NT = Not a target analyte

--- = No MCL available

* = Action levels based on corrosion

Bold= value exceeding MCL

Table 15
Detected VOCs and Metals in Groundwater
Supplemental Remedial Investigation for Parcel B
Through March 2000
Gentile AFS, Kettering, Ohio
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Parameter	Maximum Contaminant Level	S1MW04						S1MW05				
		2/14/1996	11/14/1996	8/28/1998	11/19/1998	2/24/1999	Reg / Dup 05/27/99	Reg / Dup 11/14/1996	8/31/1998	11/18/1998	2/23/1999	05/25/99
VOCs in µg/L												
1,1,1-Trichloroethane	200	0.97 J	1.5	0.9 J	1 J	1	1 / 0.9 J	1 U / 1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	---	0.54 J	0.41 J	1 U	0.7 J	0.5 J	0.6 J / 0.6 J	1 U / 1 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	---	1.0 U	1.0 U	1 UJ	1 U	1 U	1 U / 1 U	1 U / 1 U	1 UJ	1 UJ	1 U	1 U
1,2,4-Trichlorobenzene	---	1.0 U	1.0 U	1 U	1 U	1 U	1 U / 1 U	1 U / 1 U	1 U	1 UJ	1 U	1 U
1,2,4-Trimethylbenzene	---	1.0 U	1.0 U	1 U	1 UJ	1 U	1 U / 1 U	1 U / 1 U	1 U	1 UJ	1 U	1 U
1,3,5-Trimethylbenzene	---	1.0 U	1.0 U	1 U	1 UJ	1 U	1 U / 1 U	1 U / 1 U	1 U	1 UJ	1 U	1 U
Benzene	5	1.0 U	1.0 U	1 U	1 UJ	1 U	1 U / 1 U	1 U / 1 U	1 U	1 UJ	1 U	1 U
Bromodichloromethane	100 ^(T)	1.0 U	1.0 U	1 U	1 U	1 U	1 U / 1 U	1 U / 1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	5	1.0 U	1.0 U	1 U	1 U	1 U	1 U / 1 U	1 U / 1 U	1 U	1 U	1 U	1 U
Chloroform	100 ^(T)	0.16 J	0.24 J	1 U	1 U	1 U	1 U / 1 U	1 U / 1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	100 ^(T)	1.0 U	1.0 U	1 U	1 U	1 U	1 U / 1 U	1 U / 1 U	1 U	1 U	1 U	1 U
Ethylbenzene	700	1.0 U	1.0 U	1 U	1 UJ	1 U	1 U / 1 U	1 U / 1 U	1 U	1 UJ	1 U	1 U
Methylene Chloride	---	1.0 U	0.63 J	1 U	1 U	1 U	1 UJ / 1 UJ	0.82 J / 0.82 J	1 U	2 U	1 U	1 U
Naphthalene	---	1.0 U	1.0 U	1 UJ	1 U	1 U	1 U / 1 U	1 U / 1 U	1 UJ	1 U	1 U	1 U
m,p-Xylene	10 ^(TX)	1.0 U	1.0 U	2 U	2 UJ	2 U	2 U / 2 U	1 U / 1 U	2 U	2 UJ	2 U	2 U
o-Xylene	10 ^(TX)	1.0 U	1.0 U	1 U	1 UJ	1 U	1 U / 1 U	1 U / 1 U	1 U	1 UJ	1 U	1 U
Tetrachloroethylene	5	1.0 U	1.0 U	1 UJ	1 U	1 U	1 U / 1 U	1 U / 1 U	9 J	1 U	1 U	1 U
Toluene	1000	1.0 U	0.23 J	1 U	6	1 U	1 U / 1 U	0.22 J / 0.22 J	1 U	1 UJ	1 U	1 U
Trichloroethylene	5	5.4	6.5	4	5	4	4 / 4	1 U / 1 U	2	1 U	1 U	1 U
cis-1,2-Dichloroethylene	70	1.0 U	1.0 U	1 U	1 U	1 U	1 U / 1 U	1 U / 1 U	1 U	1 U	1 U	1 U
2-Butanone	---	NT	NT	NT	NT	NT	2 U / 2 U	NT	NT	NT	NT	2 U
Acetone	---	NT	NT	NT	NT	NT	2 U / 2 U	NT	NT	NT	2 J	2 U
METALS in µg/L												
Aluminum	---	31700	NS	7130 J	NS	NS	NS	40800 / 36400	1870 J	NS	NS	NS
Arsenic	50	27	NS	11 J	NS	NS	NS	44 / 34	10.9 J	NS	NS	NS
Barium	2,000	300	NS	120	NS	NS	NS	430 / 370	145	NS	NS	NS
Cadmium	5	1 U	NS	19.4	NS	NS	NS	1.5 J / 1.1 J	1.0 U	NS	NS	NS
Calcium	---	484000	NS	233000	NS	NS	NS	792000 / 611000	270000	NS	NS	NS
Chromium	100	70 U	NS	70.0 U	NS	NS	NS	71 / 70 U	70.0 U	NS	NS	NS
Copper	1300*	72	NS	60.0 U	NS	NS	NS	140 / 110	60.0 U	NS	NS	NS
Iron	---	64300	NS	16900 J	NS	NS	NS	100000 / 81000	25300 J	NS	NS	NS
Lead	15*	40	NS	17.7 J	NS	NS	NS	74 / 56	7.9 J	NS	NS	NS
Magnesium	---	195000	NS	89000	NS	NS	NS	338000 / 259000	88300	NS	NS	NS
Manganese	---	1500	NS	1080	NS	NS	NS	2500 / 2000	643	NS	NS	NS
Mercury	---	1 U	NS	0.27 U	NS	NS	NS	1 U / 1 U	0.26 U	NS	NS	NS
Potassium	---	15600	NS	5000 U	NS	NS	NS	11800 / 11900	5000 U	NS	NS	NS
Selenium	50	8	NS	5.0 UJ	NS	NS	NS	5 U / 5 U	5.0 UJ	NS	NS	NS
Sodium	---	97600	NS	85300	NS	NS	NS	33800 / 34800	45800	NS	NS	NS
Thallium	2	5 U	NS	2.0 U	NS	NS	NS	2.2 J / 2 U	2.0 U	NS	NS	NS
Vanadium	---	80 U	NS	80 U	NS	NS	NS	100 / 88	80 U	NS	NS	NS
Zinc	---	280	NS	272	NS	NS	NS	380 J / 280 J	681	NS	NS	NS

J = Estimated concentration because result was below the reporting limit and/or quality control criteria were not met.

U = The compound was analyzed for, but not detected. Value shown is the reporting limit.

UJ = The compound was analyzed for, but not detected. The reporting limit is estimated.

NA = Not analyzed

NS = Not sampled

T = Total Trihalomethane

TX = Total Xylene

NT = Not a target analyte

--- = No MCL available

* = Action levels based on corrosion

Bold= value exceeding MCL

Table 15
Detected VOCs and Metals in Groundwater
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Parameter	Maximum Contaminant Level	S1MW06					S1MW07				S1MW08			
				Reg / Dup										
		8/27/1998	11/17/1998	2/24/1999	05/26/99	3/17/2000	8/31/1998	11/17/1998	2/23/1999	05/25/99	8/27/1998	11/17/1998	2/23/1999	05/26/99
VOCs in µg/L														
1,1,1-Trichloroethane	200	2	1 J	0.8 J/0.9 J	1	0.8 J	1 U	1 U	1 U	1 U	1	1 J	2	2
1,1-Dichloroethane	---	2	1	0.8 J/0.8 J	0.8 J	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	---	1 UJ	1 U	1 U/1 U	1 U	1 U	1 UJ	1 U	1 U	2	1 UJ	1 U	1 U	1 U
1,2,4-Trichlorobenzene	---	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	0.7 J	1 U	1 U	1 U	1 U
1,2,4-Trimethylbenzene	---	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	---	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Benzene	5	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	100 ^(T)	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	5	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	100 ^(T)	3	2	1 / 1	1 U	1	1 U	1 U	1 U	1 U	0.8 J	0.8 J	0.6 J	1 U
Dibromochloromethane	100 ^(T)	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	700	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methylene Chloride	---	1 U	2 U	1 U/1 U	1 UJ	1 UJ	1 U	1 U	1 U	2 UJ	1 U	2 U	1 U	1 UJ
Naphthalene	---	1 UJ	1 U	1 U/1 U	1 U	1 UJ	1 UJ	1 U	1 U	2	1 UJ	1 U	1 U	1 U
m,p-Xylene	10 ^(TX)	2 U	2 U	1 U/1 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
o-Xylene	10 ^(TX)	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethylene	5	6 J	0.9 J	1 / 1	0.9 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	1000	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethylene	5	1	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethylene	70	1 U	1	1 U/0.5 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	---	NT	NT	3 J/4 J	2	NT	NT	NT	NT	2 U	NT	NT	NT	2 U
Acetone	---	NT	NT	NT	2	NT	NT	NT	NT	2 U	NT	NT	NT	2 U
METALS in µg/L														
Aluminum	---	971 J	NS	NS	NS	NS	1610 J	NS	NS	NS	859 J	NS	NS	NS
Arsenic	50	19.6 J	NS	NS	NS	NS	5.0 UJ	NS	NS	NS	5.0 UJ	NS	NS	NS
Barium	2,000	579	NS	NS	NS	NS	159	NS	NS	NS	479	NS	NS	NS
Cadmium	5	1.0 U	NS	NS	NS	NS	1.0 U	NS	NS	NS	1.0 U	NS	NS	NS
Calcium	---	106000	NS	NS	NS	NS	80500	NS	NS	NS	156000	NS	NS	NS
Chromium	100	70.0 U	NS	NS	NS	NS	70.0 U	NS	NS	NS	70.0 U	NS	NS	NS
Copper	1300*	60.0 U	NS	NS	NS	NS	60.0 U	NS	NS	NS	60.0 U	NS	NS	NS
Iron	---	8030	NS	NS	NS	NS	4800 J	NS	NS	NS	2830	NS	NS	NS
Lead	15*	5.0 UJ	NS	NS	NS	NS	5.0 UJ	NS	NS	NS	5.0 UJ	NS	NS	NS
Magnesium	---	45100	NS	NS	NS	NS	30100	NS	NS	NS	52800	NS	NS	NS
Manganese	---	555	NS	NS	NS	NS	208	NS	NS	NS	862	NS	NS	NS
Mercury	---	0.26 U	NS	NS	NS	NS	0.26 U	NS	NS	NS	0.26 U	NS	NS	NS
Potassium	---	5000 U	NS	NS	NS	NS	5000 U	NS	NS	NS	5000 U	NS	NS	NS
Selenium	50	5.0 UJ	NS	NS	NS	NS	5.0 UJ	NS	NS	NS	5.0 UJ	NS	NS	NS
Sodium	---	63700	NS	NS	NS	NS	199000	NS	NS	NS	33800	NS	NS	NS
Thallium	2	2.0 U	NS	NS	NS	NS	2.0 U	NS	NS	NS	2.0 U	NS	NS	NS
Vanadium	---	80 U	NS	NS	NS	NS	80 U	NS	NS	NS	80 U	NS	NS	NS
Zinc	---	36.1	NS	NS	NS	NS	54.1	NS	NS	NS	30.4	NS	NS	NS

J = Estimated concentration because result was below the reporting limit and/or quality control criteria were not met.

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UJ = The compound was analyzed for, but not detected. The reporting limit is estimated.

NA = Not analyzed

NS = Not sampled

T = Total Trihalomethane

TX = Total Xylene

NT = Not a target analyte

--- = No MCL available

* = Action levels based on corrosion

Bold= value exceeding MCL

Table 15
Detected VOCs and Metals in Groundwater
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Parameter	Maximum Contaminant Level	S1MW09					S1MW10		S1MW11		S1MW12	S1MW13	S1MW14	S1MW15	S1MW16
							Reg / Dup								
		8/31/1998	11/17/1998	2/24/1999	05/26/99	3/17/2000	05/26/99	3/17/2000	05/26/99	3/17/2000	05/25/99	05/25/99	3/17/2000	3/17/2000	3/17/2000
VOCs in µg/L															
1,1,1-Trichloroethane	200	1 U	1 U	1 U	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1	1	3
1,1-Dichloroethane	---	4	3	2	1	1	1 U/1 U	1 U	1 U	1 U	1 U	1 U	0.8 J	1 U	1
1,2,3-Trichlorobenzene	---	1 UJ	1 U	1 U	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trichlorobenzene	---	1 U	1 U	1 U	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trimethylbenzene	---	1 U	1 U	1 UJ	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	---	1 U	1 U	1 UJ	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Benzene	5	1 U	1 U	1 UJ	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	100 ^(T)	1 U	1 U	1 U	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	5	1 U	1 U	1 U	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	0.5 J	1 U	1 U
Chloroform	100 ^(T)	1 U	1 U	1 U	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1	0.6 J	0.8 J
Dibromochloromethane	100 ^(T)	1 U	1 U	1 U	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	700	1 U	1 U	1 UJ	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methylene Chloride	---	1 U	2 U	1 U	1 UJ	1 UJ	1 UJ/1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
Naphthalene	---	1 UJ	1 U	1 U	1 U	0.8 J	1 U/1 U	1 UJ	1 U	1 UJ	1 U	1 U	1 UJ	1 UJ	1 UJ
m,p-Xylene	10 ^(TX)	2 U	2 U	2 UJ	2 U	2 U	2 U/2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
o-Xylene	10 ^(TX)	1 U	1 U	1 UJ	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethylene	5	1 U	1 U	1 U	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.6 J	1 U
Toluene	1000	1 U	1 U	1 UJ	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	0.6 J	1 U	1 U
Trichloroethylene	5	1 U	1 U	1 U	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.6 J
cis-1,2-Dichloroethylene	70	1 U	1 U	1 U	1 U	1 U	1 U/1 U	1 U	1 U	1 U	1 U	1 U	0.6 J	1 U	1 U
2-Butanone	---	NT	NT	NT	2 U	NT	2 U/2 U	NT	2 U	NT	2 U	2 U	NT	NT	NT
Acetone	---	NT	NT	3 J	2 U	NT	2 U/2 U	NT	2 U	NT	2 U	2 U	NT	NT	NT
METALS in µg/L															
Aluminum	---	4940 J	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Arsenic	50	5.0 UJ	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Barium	2,000	102	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cadmium	5	1.0 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Calcium	---	232000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Chromium	100	70.0 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Copper	1300*	60.0 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Iron	---	11000 J	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Lead	15*	11.9 J	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Magnesium	---	83000	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Manganese	---	674	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Mercury	---	0.26 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Potassium	---	5000 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Selenium	50	5.0 UJ	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sodium	---	90900	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Thallium	2	2.0 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Vanadium	---	80 U	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Zinc	---	66.4	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

J = Estimated concentration because result was below the reporting limit and/or quality control criteria were not met.
 U = The compound was analyzed for, but not detected. Value shown is the reporting limit.
 UJ = The compound was analyzed for, but not detected. The reporting limit is estimated.
 NA = Not analyzed
 NS = Not sampled
 T = Total Trihalomethane
 TX = Total Xylene
 NT = Not a target analyte
 --- = No MCL available
 * = Action levels based on corrosion
 Bold = value exceeding MCL

Table 15
Detected VOCs and Metals in Groundwater
Supplemental Remedial Investigation for Parcel B
Through March 2000
Gentile AFS, Kettering, Ohio
Page 5 of 5

Parameter	Maximum Contaminant Level	S1MW17	S1RW01	S3MW01						S3MW02							
				Reg / Dup		Reg / Dup							Reg / Dup				
		3/17/2000	3/17/2000	2/9/1996	11/14/1996	8/27/1998	11/17/1998	2/23/1999	05/26/99	2/12/1996	11/14/1996	8/27/1998	11/19/1998	2/24/1999	05/26/99		
VOCs in µg/L																	
1,1,1-Trichloroethane	200	2	2	0.22 J/ 0.23 J	0.54 J	0.8 J/ 0.8 J	1 U	1 U	1 U	0.32 J	0.45 J	0.5 J	0.7 J	0.5 J/ 1 U	1 U		
1,1-Dichloroethane	---	1	1	1.0 U/1.0 U	1.0 U	1 U/1 U	1 U	1 U	1 U	1.0 U	1.0 U	1 U	1 U	1 U/1 U	1 U		
1,2,3-Trichlorobenzene	---	1 U	1 U	1.0 U/1.0 U	1.0 U	1 UJ/ 1 UJ	1 UJ	1 U	1 U	1.0 U	1.0 U	1 UJ	1 U	1 UJ/ 1 UJ	1 U		
1,2,4-Trichlorobenzene	---	1 U	1 U	1.0 U/1.0 U	1.0 U	1 U/1 U	1 UJ	1 U	1 U	1.0 U	1.0 U	1 U	1 U	1 UJ/ 1 UJ	1 U		
1,2,4-Trimethylbenzene	---	1 U	1 U	1.0 U/1.0 U	1.0 U	1 U/1 U	1 UJ	1 U	1 U	1.0 U	1.0 U	1 U	1 U	1 UJ/ 1 UJ	1 U		
1,3,5-Trimethylbenzene	---	1 U	1 U	1.0 U/1.0 U	1.0 U	1 U/1 U	1 UJ	1 U	1 U	1.0 U	1.0 U	1 U	1 U	1 UJ/ 1 UJ	1 U		
Benzene	5	1 U	1 U	1.0 U/1.0 U	1.0 U	1 U/1 U	1 U	1 U	1 U	1.0 U	1.0 U	1 U	1 UJ	1 UJ/ 1 UJ	1 U		
Bromodichloromethane	100 ^(T)	1 U	1 U	1.0 U/1.0 U	1.0 U	1 U/1 U	1 U	1 U	1 U	4.0	2.9	1 U	1 U	1 U/1 U	1 U		
Carbon Tetrachloride	5	1 U	1 U	1.0 U/1.0 U	1.0 U	1 U/1 U	1 U	1 U	1 U	1.5	0.79 J	1 U	1 U	1 U/1 U	1 U		
Chloroform	100 ^(T)	1 U	1 U	1.0 U/1.0 U	1.0 U	1 U/1 U	1 U	1 U	1 U	6.2	5.1	0.8 J	0.8 J	0.6 J/ 0.5 J	1 U		
Dibromochloromethane	100 ^(T)	1 U	1 U	1.0 U/1.0 U	1.0 U	1 U/1 U	1 U	1 U	1 U	1.9	1.3	1 U	1 U	1 U/1 U	1 U		
Ethylbenzene	700	1 U	1 U	1.0 U/1.0 U	1.0 U	1 U/1 U	1 UJ	1 U	1 U	1.0 U	1.0 U	1 U	1 U	1 UJ/ 1 UJ	1 U		
Methylene Chloride	---	1 UJ	1 UJ	1.0 U/1.0 U	14	1 U/1 U	2 UJ	1 U	1 UJ	1.0 U	0.60 J	1 U	4	1 U/1 U	1 UJ		
Naphthalene	---	1 UJ	1 UJ	1.0 U/1.0 U	1.0 U	1 UJ/ 1 UJ	1 UJ	1 U	1 U	1.0 U	1.0 U	1 UJ	1 U	1 U/1 U	1 U		
m,p-Xylene	10 ^(TX)	2 U	2 U	1.0 U/1.0 U	1.0 U	2 U/ 2 U	2 U	2 U	2 U	1.0 U	1.0 U	2 U	2 U	1 UJ/ 1 UJ	2 U		
o-Xylene	10 ^(TX)	1 U	1 U	1.0 U/1.0 U	1.0 U	1 U/1 U	1 UJ	1 U	1 U	1.0 U	1.0 U	1 U	1 U	1 UJ/ 1 UJ	1 U		
Tetrachloroethylene	5	1 U	1 U	1.0 U/1.0 U	1.0 U	5 J/ 5 J	1 U	1 U	1 U	0.14 J	0.27 J	1 U	1 U	1 U/1 U	1 U		
Toluene	1000	1 U	1 U	1.0 U/1.0 U	1.0 U	1 U/1 U	1 UJ	1 U	1 U	1.0 U	0.24 J	1 U	0.6 J	1 UJ/ 1 UJ	1 U		
Trichloroethylene	5	1 U	1 U	0.24 J/ 0.23 J	0.45 J	2 / 2	1 U	1 U	1 U	1.0 U	1.0 U	1 U	1 U	1 U/1 U	1 U		
cis-1,2-Dichloroethylene	70	1 U	1	1.0 U/1.0 U	1.0 U	1 U/1 U	1 U	1 U	1 U	1.0 U	1.0 U	1 U	1 U	1 U/1 U	1 U		
2-Butanone	---	NT	NT	NT / NT	NT	NT	NT	NT	2 U	NT	NT	NT	NT	NT	2 U		
Acetone	---	NT	NT	NT / NT	NT	NT	NT	NT	2 U	NT	NT	NT	NT	5J / NT	2 U		
METALS in µg/L																	
Aluminum	---	NS	NS	NA	7100	1270 / 1090	NS	NS	NS	NA	NS	1450 J	NS	NS	NS		
Arsenic	50	NS	NS	31 / 25	16	5.0 UJ / 5.1 J	NS	NS	NS	76	NS	5 UJ	NS	NS	NS		
Barium	2,000	NS	NS	430 / 390	250	268 / 243	NS	NS	NS	800	NS	373	NS	NS	NS		
Cadmium	5	NS	NS	1 U/ 1 U	1 U	1.0 U/ 1.0 U	NS	NS	NS	1 U	NS	1 U	NS	NS	NS		
Calcium	---	NS	NS	NA	139000	302000 / 186000	NS	NS	NS	NA	NS	323000	NS	NS	NS		
Chromium	100	NS	NS	70 U/ 70 U	70 U	70.0 U / 70.0U	NS	NS	NS	72	NS	70.0 U	NS	NS	NS		
Copper	1300*	NS	NS	NA	60 U	60.0 U / 60.0 U	NS	NS	NS	NA	NS	60.0 U	NS	NS	NS		
Iron	---	NS	NS	42200 / 35800	22200	2440 J / 1700 J	NS	NS	NS	NA	NS	1560	NS	NS	NS		
Lead	15*	NS	NS	32 / 27	18	15.1 J / 8.6 J	NS	NS	NS	69	NS	9.8 J	NS	NS	NS		
Magnesium	---	NS	NS	NA	50000	92600 J / 61100 J	NS	NS	NS	NA	NS	105000	NS	NS	NS		
Manganese	---	NS	NS	NA	390	768 / 533 J	NS	NS	NS	NA	NS	893	NS	NS	NS		
Mercury	---	NS	NS	1 U/ 1 U	1 U	0.26 U/ 0.26 U	NS	NS	NS	1 U	NS	0.30	NS	NS	NS		
Potassium	---	NS	NS	NA	5000 U	5000 U/ 5000 U	NS	NS	NS	NA	NS	5000 U	NS	NS	NS		
Selenium	50	NS	NS	5 U/ 5 U	5 U	5.0 U/ 5.0 U	NS	NS	NS	8 J	NS	5.0 UJ	NS	NS	NS		
Sodium	---	NS	NS	NA	155000	93200 / 93000	NS	NS	NS	NA	NS	91600	NS	NS	NS		
Thallium	2	NS	NS	NA	2 U	2.0 U / 2.0 U	NS	NS	NS	NA	NS	2.0 U	NS	NS	NS		
Vanadium	---	NS	NS	NA	80 U	80 U / 80 U	NS	NS	NS	NA	NS	80 U	NS	NS	NS		
Zinc	---	NS	NS	NA	130	51.9 / 47.6	NS	NS	NS	NA	NS	47.5	NS	NS	NS		

J = Estimated concentration because result was below the reporting limit and/or quality control criteria were not met.
U = The compound was analyzed for, but not detected. Value shown is the reporting limit.
UJ = The compound was analyzed for, but not detected. The reporting limit is estimated.
NA = Not analyzed
NS = Not sampled
T = Total Trihalomethane
TX = Total Xylene
NT = Not a target analyte
--- = No MCL available
* = Action levels based on corrosion
Bold = value exceeding MCL

Table 16
Detected VOCs In Groundwater
Parcel B Long-Term Monitoring Program
Gentile AFS, Kettering, Ohio
1 of 2

First 5-Year Review
Gentile AFS
June 2004

LOCATION	DATE	1,1,1-TCA	1,1-DCA	Bromodichloromethane	Carbon Tetrachloride	Chloroform	PCE	TCE	cis-1,2-DCE
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
MCL		200	---	100 ⁽¹⁾	5	100 ⁽¹⁾	5	5	70
S1MW01	2/17/2001	1.96	0.60 J	1 U	0.97 J	0.42	4.89	0.72 J	1.79
	5/22/2001	1.97 M	0.35 M	1 U	0.92 M	0.4 J	3.1 M	0.59 M	0.87 M
	8/28/2001	2.40	0.50 J	1 U	0.93 J	0.51 J	7.08	1.02	2.10
	11/19/2001	2.75/2.64	0.532 J/0.487 J	1 U/1 U	0.999 J/1.03	0.522 J/0.535 J	6.64 M/6.11	0.915 J/0.879 J	2.0/1.74
	5/17/2002	4.18/4.24	3.13/3.12	1 U/1 U	1.26/1.23	2.39/2.42	7.08/7.36	1.17/1.16	4.42/4.51
	11/11/2002	2.34	0.94	0.277	1.46	1.70	6.08	1.04	2.21
	5/14/2003	1.14	1 U	0.483 J	1.48	1.43	1.68	0.55	1 U
S1MW02	2/17/2001	3.26	1.12	1 U	1 U	1.06	1 U	0.30 J	0.31 J
	5/22/2001	2.44	0.94 J	1 U	1 U	0.62 J	1 U	0.27 J	1 U
	8/29/2001	2.29	1.00	1 U	1 U	0.54 J	1 U	0.33 J	1 U
	11/16/2001	2.30	0.975 J	1 U	1 U	0.621 J	1 U	0.261 J	1 U
	5/16/2002	2.53	0.73	1 U	1 U	1 U	1 U	1 U	1 U
	11/8/2002	1.86	0.868	1 U	1 U	0.262	1 U	1 U	1 U
	5/15/2003	1.72	1.47	1 U	1 U	0.185 J	1 U	1 U	0.326 J
S1MW04	2/17/2001	1.10/ 1.05	0.83/ 0.82 J	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	4.60/ 4.40	1 U/ 1 U
	5/22/2001	1.01	0.7 J	1 U	1 U	1 U	1 U	4.60	1 U
	8/29/2001	0.98 J/ 0.89 J	0.77 J/ 0.69 J	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	1 U/ 1 U	4.70/ 4.34	1 U/ 1 U
	11/19/2001	0.898 J	0.711 J	1 U	1 U	1 U	0.586 J	4.95	1 U
	5/17/2002	1.01	1.19	1 U	1 U	1 U	1 U	5.47	1 U
	11/11/2002	1.16	1.89	1 U	1 U	0.138	1 U	5.47	1 U
	5/16/2003	1 U	1.59	1 U	1 U	0.133 J	1 U	5.52	1 U
S1MW06	2/16/2001	1.58	4.60	1 U	1 U	0.99 J	0.32 J	0.37 J	1.47
	5/23/2001	2.19	6.57	1 U	1 U	1.32	1 U	0.38 J	2.52
	8/29/2001	5.32	1.12	1 U	0.58 J	0.64 J	1 U	1 U	1 U
	11/17/2001	2.75	9.09	1 U	1 U	0.569 J	1 U	0.453 J	4.43
	5/16/2002	1.97	4.96	1 U	1 U	1.29	1 U	1 U	2.39
	11/7/2002	2.46	5.06	0.376	0.475	2.24	1 U	0.424	3.17
	5/14/2003	1 U	1 U	1 U	1 U	1 U	1 U	11.3	0.71

Table 16
Detected VOCs In Groundwater
Parcel B Long-Term Monitoring Program
Gentile AFS, Kettering, Ohio
2 of 2

First 5-Year Review
Gentile AFS
June 2004

LOCATION	DATE	1,1,1-TCA	1,1-DCA	Bromodichloromethane	Carbon Tetrachloride	Chloroform	PCE	TCE	cis-1,2-DCE
Units		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
MCL		200	---	100 ⁽¹⁾	5	100 ⁽¹⁾	5	5	70
S1MW09	2/16/2001	1 U	3.65	1 U	1 U	1 U	1 U	1 U	1 U
	5/22/2001	1 U	4.45	1 U	1 U	1 U	1 U	1 U	1 U
	8/28/2001	1 U	3.26	1 U	1 U	1 U	1 U	1 U	1 U
	11/17/2001	1 U	3.70	1 U	1 U	1 U	1 U	1 U	1 U
	5/16/2002	1 U	3.63	1 U	1 U	1 U	1 U	1 U	1 U
	11/8/2002	1 U/1 U	1.86/1.92	1 U/1 U	1 U/1 U	1 U/1 U	1 U/1 U	1 U/1 U	1 U/1 U
	5/15/2003	1 U	2.57	1 U	1 U	1 U	1 U	1 U	1 U
S1MW10	2/15/2001	1 U	1.15	1 U	1 U	1 U	1 U	1 U	0.67 J
	5/23/2001	1 U	1.04	1 U	1 U	1 U	1 U	1 U	0.63 J
	8/30/2001	1 U	1.08	1 U	1 U	1 U	1 U	1 U	0.61 J
	11/15/2001	1 U	1.20	1 U	1 U	1 U	1 U	1 U	1 U
	5/16/2002	1 U	1.04	1 U	1 U	1 U	1 U	1 U	0.58
	11/8/2002	1 U	0.928	1 U	1 U	1 U	1 U	1 U	0.49
	5/15/2003	1 U	0.758	1 U	1 U	1 U	1 U	1 U	0.401 J
S1MW11	2/15/2001	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	5/23/2001	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	8/30/2001	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	11/15/2001	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	5/15/2002	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	11/7/2002	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	5/15/2003	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
S3MW02	2/15/2001	0.52 J	1 U	0.70 J	0.41 J	2.93	0.43 J	1 U	1 U
	5/23/2001	0.56 J/ 0.54 J	0.32/ 0.33 J	1.34/ 1.33	0.44 J/ 0.47 J	3.31/ 3.39	0.39 J/ 0.38	1 U/ 1 U	0.28/ 0.31 J
	8/29/2001	0.91 J	1.12	1.41	0.60 J	2.82	0.38 J	1 U	1.33
	11/17/2001	1.29	1.30	1 U	0.825 J	2.23	0.26	1 U	1.78
	5/17/2002	0.46	1 U	1 U	0.26	1.14	0.30	1 U	1 U
	11/11/2002	0.55	1 U	1 U	0.292	0.503	0.309	1 U	1 U
	5/15/2003	1 U/1 U	1 U/1 U	1 U/1 U	1 U/1 U	0.376/0.421	1 U/1 U	1 U/1 U	0.653/0.613

TCA = Trichloroethane
DCA = Dichloroethane
PCE = Tetrachloroethylene
TCE = Trichloroethylene
DCE = Dichloroethylene
(ug/L) = micrograms/liter
Concentrations in **bold** exceed MCLs

MCL = maximum contaminant level
--- = No MCL available
T = Total Trihalomethane
0.56/ 0.54 = original sample result/ duplicate sample result
J = Estimated concentration because result was below the reporting limit and/or quality control criteria were not met.
U = The compound was analyzed for, but not detected. Value shown is the reporting limit.
M = The matrix effect was present.

Table 17
Detected VOCs in Groundwater
Parcel E
Gentile AFS, Kettering, Ohio

WELL LOCATION	VOCs (µg/L)	Benzene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	TCE	Vinyl chloride
	MCL	5	70	100	5	2
DATE						
D1MW38 C7	10/30/2002	1 U	1 U	1 U	1 U	1 U
	12/11/2002	1U	1U	1U	1U	1U
	2/26/2003	1U	1U	1U	1U	1U
	5/14/2003	1U/1U	1U/1U	1U/1U	1U/1U	1U/1U
D1MW42 C7	10/31/2002	0.36 F	120	6.7	1 U	41
	12/11/2002	0.36 F	144	6.27	1 U	21.7
	2/26/2003	1 U	243	9.29 F	1 U	9.40 F
	5/13/2003	0.424 F	173	10.5	1 U	0.996 M J
D1MW43 C7	10/31/2002	1 U	1U	1 U	1 U	1 U
	12/12/2002	1U	1U	1U	1U	1U
	2/26/2003	1U	1U	1U	1U	1U
	5/14/2003	1U	1U	1U	1U	1U
D1MW44 C7	10/30/2002	1 U	1 U	1 U	1 U	1 U
	12/11/2002	1U	1U	1U	1U	1U
	2/26/2003	1U	1U	1U	1U	1U
	5/13/2003	1U	1U	1U	1U	1U
D1MW47 C7	10/30/2002	1 U	1 U	1 U	1 U	1 U
	12/10/2002	1U	1U	1U	1U	1U
	2/25/2003	1U	1U	1U	1U	1U
	5/13/2003	1U	1U	1U	1U	1U
D1MW48 C7	10/30/2002	1 U	1 U	1 U	1 U	1 U
	12/10/2002	1U	1U	1U	1U	1U
	2/26/2003	1U	1U	1U	1U	1U
	5/13/2003	1U	1U	1U	1U	1U
D1MW49 C7	10/31/2002	1 U/1 U	2.1/2	1 U/1 U	5.9/5.5	0.32 F/1 U
	12/12/2002	1U	0.533 F	1U	2.09	1U
	2/27/2003	1U/1 U	0.487 F/0.544 F	1U/1 U	1.15/1.18	1U/1 U
	5/14/2003	1U	0.313 F	1U	0.692 F	1U
D1MW50 D1	10/31/2002	1 U	1.3	1 U	16	1 U
	12/12/2002	1U/1U	0.519 F/0.452 F	1U/1U	11.7/12	1U/1U
	2/27/2003	1 U	0.953 F	1 U	13.7	1 U
	5/14/2003	1 U	0.899 F	1 U	1 U	1 U
D3MW01	10/30/2002	1 U	1 U	1 U	1 U	1 U
	12/10/2002	1U	1U	1U	1U	1U
	2/25/2003	1U	1U	1U	1U	1U
	5/13/2003	1U	1U	1U	1U	1U

(ug/L) = micrograms/liter

MCL = maximum contaminant level

0.56/ 0.54 = original sample result/duplicate sample result

U = The compound was analyzed for, but not detected. Value shown is the reporting limit.

J = Value considered estimated due to out-of-control associated QC.

M = Result was qualified by the lab due to matrix effects for out of control RPD between % recoveries of MS/MSD.

TCE = Trichloroethylene

F = laboratory flag, results > MDL but < RL

MDL = method detection limit

RL = reporting limit

Concentrations in bold exceed MCLs

Table 18

**Summary of Applicable or Relevant and Appropriate Requirements (ARARs)
Five-Year Review
Gentile AFS, Ohio**

Chemical	ARARs ^a µg/L
Arsenic	50 ^b 10 ^b
Benzene	5
Cis-1,2-Dichloroethylene	70
Trans-1,2-Dichloroethylene	100
1,1-Dichloroethylene	7
Methylene chloride	5
Naphthalene	100 ^c
Tetrachloroethylene	5
Toluene	1,000
1,1,2-Trichloroethane	5
Trichloroethylene	5
Vinyl chloride	2

- ^a According to a Gentile BRAC Closure Team (BCT) decision made on February 18, 1999, decisions relative to groundwater will not be made on a site-specific risk assessment basis. Decisions based on all monitoring wells meeting Maximum Contaminant Levels (MCLs).
- ^b The MCL for arsenic has been reduced from 50 µg/L to 10 µg/L. The rule became effective on February 22, 2002. The date by which systems must comply with the new standard of 10 µg/L is January 23, 2006.
- ^c There is no MCL for naphthalene. The ARAR is based on a Health Advisory value for lifetime exposure (URSG, 2001).

Table 19
Summary of Remedial Action Objectives (RAOs)
Five-Year Review
Gentile AFS, Ohio

Site	Remedial Action Objective	Reference
R2, Parcel A	<ul style="list-style-type: none"> Prevent exposure to contaminated groundwater by implementing institutional controls. 	Decision Document, Remediation Site R2 Floor Drain to Infiltration Pit, USAF, April 1997.
	<ul style="list-style-type: none"> Monitor the groundwater plume to ensure it does not become a component of a complete exposure pathway. 	
	<ul style="list-style-type: none"> Monitor the plume to ensure that it does not migrate off-base. 	
Groundwater, Parcel B	<ul style="list-style-type: none"> Restore the groundwater at the site to drinking water quality. 	Decision Document, Parcel B Groundwater, USAF, September 2000.
	<ul style="list-style-type: none"> Prevent exposure to groundwater by implementing institutional controls. 	
	<ul style="list-style-type: none"> Monitor the groundwater plume to ensure that it does not become a component of a complete exposure pathway. 	
	<ul style="list-style-type: none"> Monitor the plume to ensure that it does not migrate off-base. 	
C7 and D1, Parcel E	<ul style="list-style-type: none"> The overall goal for Parcel E was to minimize the potential for human contact with contaminated soil, assuming future residential land use. Exposure pathways to be considered include: incidental soil ingestion, dermal contact with soil, and inhalation of chemicals released from soil to both indoor and outdoor air. 	Decision Document, Sites C7 and D1 Within Parcel E, USAF, July 2002
	<ul style="list-style-type: none"> Prevent migration of contaminants from Parcel E soil that would result in groundwater contamination in excess of MCLs. 	
	<ul style="list-style-type: none"> Reduce contamination in groundwater beneath Site C7 to MCLs. 	
	<ul style="list-style-type: none"> Prevent and/or minimize the potential to human contact with groundwater beneath site C7 (and D1 implied). 	
	<ul style="list-style-type: none"> Prevent the migration of groundwater at concentrations in excess of MCLs beyond the boundary of Gentile AFS. 	
C1, Parcel E	<ul style="list-style-type: none"> Minimize the potential for contact by human and ecological receptors in sediment that exceed cleanup goals. 	Decision Document for the Final Remedy Site C-1 Within Parcel E, USAF, July 2002
	<ul style="list-style-type: none"> Provide a permanent remedy that will not have adverse affects (e.g., flooding erosion) to the creek. 	
	<ul style="list-style-type: none"> Provide a low maintenance remedy that will conform to a park setting, the proposed reuse scenario for the creek. 	

MCL = Maximum Contaminant Level.

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IRP Site	Description/Basis	Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?	References
C2A	Site soil was evaluated as part of Parcel A. NFRAP based on HHRA of general workers and construction workers.	<p>ARARs/TBCs: NFRAP based on results of risk assessment of all sites at Parcel A. Three different exposure areas were evaluated for two occupational populations (general workers and construction worker). Risk estimates and hazard indices were within acceptable levels.</p> <p>Land Use/Exposure Assumptions: The area has been paved. Therefore, there is no current exposure to soil.</p> <p>Toxicity Values: Although there were changes to toxicity values used in the risk assessment for Parcel A, the changes did not impact COPCs for Site C2A as identified in Phase I.</p> <p>RAOs/Cleanup Goals: No RAOs were specified because no remedy other than ICs was selected. ICs are based on the condition that land use remains commercial/industrial.</p>	<ul style="list-style-type: none"> • Statement of Basis/Final Decision, USAF, 1997 • Site and Risk Characterization for Parcel A, Final, URSG, 1997
D5	During the Phase I RI, Site D5 was identified as an area for further investigation. The investigation indicated levels of potential radiological constituents were within background levels.	Not applicable. NFRAP based on results indicating that no contamination was detected. This site may no longer require ICs because levels of potential radiological constituents were within background levels.	<ul style="list-style-type: none"> • Statement of Basis/Final Decision, USAF, 1997
M2	On-site soil removal and confirmatory sampling indicated concentrations of total PCBs in soil were <25 mg/kg and concentrations on surfaces were <10 µg/ 100 cm ² .	<p>ARARs/TBCs: There has been no change in cleanup levels for PCBs under TSCA.</p> <p>Land Use/Exposure Assumptions: Soil was removed at the site. Therefore, there is no exposure to soil concentrations exceeding action levels.</p> <p>Toxicity Values: See comments regarding ARARs.</p> <p>RAOs/Cleanup Levels: See comments regarding ARARs.</p>	<ul style="list-style-type: none"> • Statement of Basis/Final Decision, USAF, 1997 • 40 CFR 761, PCB Spill Cleanup Policy

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IRP Site	Description/Basis	Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?	References
M3	Soil sampling results from Phase I were compared with RBSC for industrial soil. One chemical (arsenic) was detected at concentrations above its RBSC. However, the arsenic concentration was within background.	<p>ARARs/TBCs: No ARARs were identified for this site. For TBCs, RBSCs based on Region III RBCs for residential and industrial soil (dated July-December 1995) were used for screening purposes. For this review, residential and industrial RBSCs (dated April 2003) were evaluated. Residential RBSCs for beryllium, chromium, cobalt, and manganese changed. All industrial RBSCs were updated to incorporate new exposure parameters for outdoor workers. These changes did not impact the conclusions.</p> <p>Land Use/Exposure Assumptions: This area is expected to remain commercial/industrial. The area has been paved. Therefore, there is no current exposure to soil.</p> <p>Toxicity Values: Changes in toxicity values for beryllium, chromium, cobalt, and manganese were reflected in the RBSCs.</p> <p>RAOs/Cleanup Levels: No RAOs were specified because no remedy other than ICs was selected. ICs are based on the condition that land use remains commercial/industrial.</p>	<ul style="list-style-type: none"> • Statement of Basis/Final Decision, USAF, 1997 • Phase I Remedial Investigation Report, Volume I, Final, URSG, 1996
M4	As part of gravel sampling results for Phase I, PCBs were detected below the soil action level of 25 mg/kg. Soil sampling results were compared with industrial RBSCs. None of the chemicals exceeded industrial RBSCs.	<p>ARARs/TBCs: There has been no change in the soil action level of 25 mg/kg for PCBs under TSCA. For TBCs, RBSCs based on Region III RBCs for residential and industrial soil (dated July-December 1995) were used for screening purposes. For this review, updated RBSCs were evaluated (dated April 2003). The residential RBSC for chromium decreased slightly, but did not change results of the screening. The industrial RBSC for arsenic decreased from 3.8 to 1.9 mg/kg. Although maximum values at the site exceed the new RBSC, these values are within the background range. Therefore, the change did not impact the conclusions of the Phase I screen.</p> <p>Land/Use/Exposure Assumptions: This area is expected to remain commercial/industrial. The area is located underneath a building. Therefore, there is no current exposure to soil.</p> <p>Toxicity Values: Changes in the toxicity values for chromium are reflected in the RBSC.</p> <p>RAOs/Cleanup Levels: No RAOs were specified because no remedy other than ICs was selected. ICs are based on the condition that land use remains commercial/industrial.</p>	<ul style="list-style-type: none"> • Statement of Basis/Final Decision, USAF, 1997 • 40 CFR 761, PCB Spill Cleanup Policy

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IRP Site	Description/Basis	Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?	References
O1	Site O1 (or OWS 7) was remediated and confirmatory soil samples were collected. Cleanup levels were established using Region IX PRGs (dated September 1995) at a cancer risk level of 1×10^{-6} and an HQ of 1.0. All concentrations from soil samples were below Region IX PRGs for industrial soil with the exception of arsenic. However, sample concentrations of arsenic were below the background concentration for arsenic.	<p>ARARs/TBCs: No ARARs were identified for this site. For TBCs, Region IX PRGs for industrial soil (dated September 1995) were used as cleanup levels. For this review, updated residential and industrial PRGs (dated October 2002) were evaluated. Some PRGs changed due to new toxicity values and all PRGs were updated to incorporate more recent guidance regarding dermal exposure. These changes did not impact the outcome of the original comparisons with cleanup levels.</p> <p>Land Use/Exposure Assumptions: This area is expected to remain commercial/industrial. The area is located between two active buildings.</p> <p>Toxicity Values: Changes in toxicity values were reflected in the PRGs for benzene, trichloroethylene, beryllium, chromium, cobalt, manganese, and thallium.</p> <p>RAOs/Cleanup Levels: The cleanup of O1 (OWS 7) continues to meet established cleanup levels. ICs are based on the condition that land use remains commercial/industrial.</p>	<ul style="list-style-type: none"> • Statement of Basis/Final Decision, USAF, 1997 • Decision/Closure Document for No Further Action, Installation Restoration Program, Final, Jacobs, 1997
O2	Site O2 (or OWSs 1, 2, and 3) was remediated and confirmatory soil samples were collected. Cleanup levels were established using Region IX PRGs (dated September 1995) at a cancer risk level of 1×10^{-6} and an HQ of 1.0. All concentrations from soil samples for OWSs 1 and 3 were below Region IX PRGs for industrial soil and site background for arsenic. At OWS 2, one sample contained arsenic at a concentration above the calculated background value. In comparing this concentration with the background data set, it was determined that the sample was not distinctly different from the background concentration.	<p>ARARs/TBCs: No ARARs were identified for this site. For TBCs, Region IX PRGs for industrial soil (dated September 1995) were used as cleanup levels. For this review, updated residential and industrial PRGs (dated October 2002) were evaluated. Some PRGs changed due to new toxicity values and all PRGs were updated to incorporate more recent guidance regarding dermal exposure. These changes did not impact the outcome of the original comparisons with cleanup levels.</p> <p>Land Use/Exposure Assumptions: This area is expected to remain commercial/industrial. It is noted, however, that concentrations of all detected constituents are below Region IX PRGs for residential soil, with the exception of arsenic. Arsenic concentrations are below the background for arsenic except at one sample location at OWS 2 (OWS 2-SO-005). As stated in the Decision Document, in comparing this concentration (18.2 mg/kg) with the background data set, it was determined that the sample was not distinctly different from the background concentration (16.9 mg/kg).</p>	<ul style="list-style-type: none"> • Statement of Basis/Final Decision, USAF 1997 • Decision/Closure Document for No Further Action, Installation Restoration Program, Final, Jacobs, 1997

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IRP Site	Description/Basis	Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?	References
		<p>Toxicity Values: Changes in toxicity values were reflected in the PRGs for chlorobenzene, ethylbenzene, vinyl chloride, xylenes, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, naphthalene, beryllium, chromium, cobalt, manganese, and thallium.</p> <p>RAOs/Cleanup Levels: The cleanup of O2 (OWSs 1, 2, and 3) continues to meet established cleanup levels, with the exception of Sample Location OWS 2-SO-005. However, it was determined that the sample was not distinctly different from the background concentration.</p> <p>ICs are based on the condition that land use will remain commercial/industrial. This site may no longer require ICs because concentrations of most detected constituents are also below Region IX PRGs for residential soil. Although arsenic concentrations exceed residential and industrial PRGs, all concentrations except one location (OWS 2-50-005) were below background concentrations.</p>	
O3	Site O3 (or OWSs 4, 5, and 6) was remediated. Confirmatory soil samples were collected for OWSs 4 and 5. Remedial activities at OWS 6 (floor drain) were limited to only an abandonment in place by filling with concrete. Cleanup levels were established using Region IX PRGs (dated September 1995) at a cancer risk of 1×10^{-6} and an HQ of 1.0. All concentrations from soil samples were below the Region IX PRG for industrial soil with the exception of arsenic. However, sample concentrations of arsenic were below the background concentration for arsenic.	<p>ARARs/TBCs: No ARARs were identified for this site. For TBCs, Region IX PRGs for industrial soil (dated September 1995) were used as cleanup levels. For this review, updated residential and industrial PRGs (dated October 2002) were evaluated. Some PRGs changed due to new toxicity values and all PRGs were updated to incorporate more recent guidance regarding dermal exposure. These changes did not impact the outcome of the original comparison with cleanup levels.</p> <p>Land Use/Exposure Assumptions: This area is expected to remain commercial/industrial. It is noted, however, that concentrations of all detected constituents are below the Region IX PRG for residential soil, with the exception of arsenic. Arsenic concentrations are below the background level for arsenic at the site.</p> <p>Toxicity Values: Changes in toxicity values were reflected in the PRGs for beryllium, chromium, cobalt, manganese, and thallium.</p> <p>RAOs/Cleanup Levels: The cleanup of T2 (OWS 11) continues to meet established cleanup levels. ICs are based on the condition that land use remains industrial/commercial. This site may no longer require ICs because concentrations of most detected constituents are also below Region IX PRGs for residential soil. Although arsenic concentrations exceed residential and industrial PRGs, site concentrations are below background concentrations.</p>	<ul style="list-style-type: none"> • Statement of Basis/Final Decision, USAF 1997 • Decision/Closure Document for No Further Action, Installation Restoration Program, Final, Jacobs, 1997

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IRP Site	Description/Basis	Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?	References
O4	Site O4 (or OWS 8) was remediated. Confirmatory soil samples were collected. Cleanup levels were established using Region IX PRGs (dated September 1995) at a cancer risk level of 1×10^{-6} and an HQ of 1.0. All concentrations from soil samples were below Region IX PRGs for industrial soil. It is noted that confirmatory samples for this site were not analyzed for inorganics.	<p>ARARs/TBCs: No ARARs were identified for this site. For TBCs, Region IX PRGs for industrial soil (dated September 1995) were used as cleanup levels. For this review, updated residential and industrial PRGs (dated October 2002) were evaluated. Some PRGs changed due to new toxicity values and all PRGs were updated to incorporate more recent guidance regarding dermal exposure. These changes did not impact the outcome of the original comparisons with cleanup levels.</p> <p>Land Use/Exposure Assumptions: This area is expected to remain commercial/industrial.</p> <p>Toxicity Values: Changes in toxicity values were reflected in the PRGs for naphthalene.</p> <p>RAOs/Cleanup Levels: The cleanup of O4 (OWS 8) continues to meet established cleanup levels. ICs are based on the condition that land use remains commercial/industrial.</p>	<ul style="list-style-type: none"> • Statement of Basis/Final Decision, USAF 1997 • Decision/Closure Document for No Further Action, Installation Restoration Program, Final, Jacobs, 1997

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IRP Site	Description/Basis	Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?	References
R3	Soil sampling results from Phase I were compared with Region III RBSCs for industrial soil and SSLs for migration to groundwater. With the exception of benzo(a)pyrene, none of the chemicals exceeded RBSCs or SSLs.	<p>ARARs/TBCs: No ARARs were identified for the site. For TBCs, RBSCs based on Region III RBCs for residential and industrial soil (dated January-June 1996) were used for screening purposes. For this review, residential and industrial RBSCs (dated April 2003) were evaluated. Residential RBSCs for benzene and dibenzofuran are now more stringent, but these changes did not impact the initial screen. All industrial RBSCs were updated to incorporate new exposure parameters for outdoor workers. The maximum detected value for R3 exceeds the new RBSC for benzo(a)pyrene.</p> <p>In addition, concentrations of benzene and toluene were compared with current SSLs (provided in Region III Risk-Based Concentration Tables, dated April 2003) to evaluate potential migration of constituents from soil to groundwater. The maximum detected concentration of benzene exceeds the SSL for benzene at DAF=20.</p> <p>Land Use/Exposure Assumptions: This area is expected to remain commercial/industrial. Although there are exceedances due to changes in screening criteria, the area is paved and there is no current exposure. If pavement is removed and soil is exposed in the future, further evaluation may be necessary.</p> <p>Toxicity Value: Changes in toxicity values for benzene and dibenzofuran are reflected in the RBSCs for benzene and dibenzofuran, and the SSL for benzene.</p> <p>RAOs/Cleanup Level: No RAOs were specified because no remedy other than ICs was selected. ICs are based on the condition that land use remains commercial/industrial.</p>	<ul style="list-style-type: none"> • Statement of Basis/Final Decision, USAF, 1997 • Phase I Remedial Investigation Report, Volume I, Final, URSG, 1996 • Soil Screening Guidance, USEPA, 1996

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IRP Site	Description/Basis	Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?	References
S4	Both the interior of Building 31 and soil near the tank were investigated during Phase I. Although wipe samples were collected, Building 31 was scheduled for demolition, so no further action was necessary. Because several PAHs detected in soil exceeded RBSCs, soil was evaluated as part of the HHRA of Parcel A. NFRAP was based on results of the HHRA of future construction workers.	<p>ARARs/TBCs: The NFRAP was based on results of the risk assessment. Although there were changes to residential RBSCs for 2-methyl naphthalene and dibenzofuran, these changes did not impact the results of the initial screening.</p> <p>Land Use/Exposure Assumptions: This area is expected to remain commercial/industrial. The area has been paved. Therefore, there is no current exposure to soil.</p> <p>Although the ecological RBSC for 4,4'-DDT was exceeded, exposure pathways for ecological receptors were considered to be incomplete because the property is not a suitable ecological habitat.</p> <p>Toxicity Values: There were no changes to toxicity values for the COPCs evaluated in the HHRA.</p> <p>RAOs/Cleanup Level: No RAOs were specified because no remedy other than ICs was selected. ICs are based on the condition that land use remain industrial/commercial.</p>	<ul style="list-style-type: none"> • Statement of Basis/Final Decision, USAF, 1997 • Phase I Remedial Investigation, Volume I, Final, URSG, 1996 • Site and Risk Characterization for Parcel A, Final, URSG, 1997
S5	After double-washing and rinsing of the concrete floor of the PCB storage area, cleaning and confirmatory wipe sampling of the floor was conducted. Visual site inspection of the 6-inch-deep concrete berm that surrounds the area did not reveal staining inside or outside the berm. The highest concentration of Aroclor-1254 was less than the cleanup criteria of 10 µg/ 100 cm ² .	<p>ARARs/TBCs: There has been no change in cleanup levels for PCBs under TSCA.</p> <p>Land Use/Exposure Assumptions: The area is within an active building and is expected to remain commercial/industrial.</p> <p>Toxicity Values: See comments regarding ARARs.</p> <p>RAOs/Cleanup Levels: See comments regarding ARARs.</p>	<ul style="list-style-type: none"> • Statement of Basis/Final Decision, USAF, 1997 • 40 CFR 761, PCB Spill Cleanup Policy

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IRP Site	Description/Basis	Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?	References
S7	Soil sampling results from Phase I were compared with RBSC for industrial soil. One chemical (arsenic) was detected above its RBSC. However, the arsenic concentration was within background.	<p>ARARs/TBCs: No ARARs were identified for this site. For TBCs, RBSCs based on Region III RBCs for residential and industrial soil (dated January-June 1996) were used for screening purposes. For this reason, residential and industrial RBSCs (dated April 2003) were evaluated. Residential RBSCs for beryllium, chromium, cobalt, and manganese changed. In addition, all industrial RBSCs were updated to incorporate new exposure parameters for outdoor workers. These changes did not impact the conclusions.</p> <p>Land Use/Exposure Assumptions: The area is paved and is expected to remain commercial/industrial.</p> <p>Toxicity Values: Changes in toxicity values for beryllium, chromium, cobalt, and manganese were reflected in the RBSCs.</p> <p>RAOs/Cleanup Levels: No RAOs were specified because no remedy other than ICs was selected. ICs are based on the condition that land use remain commercial/industrial.</p>	<ul style="list-style-type: none"> • Statement of Basis, Final Decision, USAF, 1997 • Phase I Remedial Investigation, Volume I, Final, URSG, 1996

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IRP Site	Description/Basis	Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?	References
S8	Soil samples were collected during Phases I and II of the RI. The only PCB detected was Aroclor-1260. Values were compared with Region III RBSCs for industrial soil. The values did not exceed industrial RBSCs.	<p>ARARs/TBCs: For TBCs, RBSCs based on Region III RBCs for industrial soil (dated January-June 1996) were used for comparison. For this review, residential and industrial RBSCs (dated April 2003) were evaluated. All industrial RBSCs were updated to incorporate new exposure parameters. The concentrations of Aroclor-1260 are below the new industrial RBSC (1.4 mg/kg). In addition, these concentrations of 0.11 and 0.076 mg/kg were below the residential RBSC of 0.32 mg/kg.</p> <p>Land Use/Exposure Assumptions: This area is expected to remain commercial/industrial. Furthermore, it is currently paved. Therefore, there is no current exposure.</p> <p>Toxicity Values: Previous RBSCs for PCBs were based on a general toxicity value for PCBs; i.e., the oral slope factor for PCBs was 7.7 (mg/kg-day)⁻¹. This toxicity value was used in the derivation of the previous RBSC. The current RBSC is based on a less conservative oral slope factor of 2.0 (mg/kg-day)⁻¹.</p> <p>RAOs/Cleanup Levels: No RAOs were specified because no remedy other than ICs was selected. ICs were based on the condition that land use remains commercial/industrial. This site may no longer require ICs because concentrations of detected constituents are below Region IX PRG for residential soil.</p>	<ul style="list-style-type: none"> • Statement of Basis/Final Decision, USAF, 1997 • Phase I Remedial Investigation, Volume I, Final, URSG, 1996 • Phase II Remedial Investigation, URSG, 1997
S9	A radiological survey of Building 45 was conducted. The survey indicated no evidence of a Cobalt-60 source.	Not applicable. NFRAP was based on results indicating that no radiological source was present. This site may no longer require ICs because there is no evidence of a Cobalt-60 source.	<ul style="list-style-type: none"> • Statement of Basis/Final Decision, USAF, 1997

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IRP Site	Description/Basis	Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?	References
T1	Site T1 (or OWS 10) was remediated and confirmatory soil samples were collected. Cleanup levels were established using Region IX PRGs (dated September 1995) at a cancer risk of 1×10^{-6} and an HQ of 1.0. All concentrations from soil samples were below the Region IX PRG for industrial soil with the exception of arsenic. However, sample concentrations of arsenic were below the background concentration for arsenic.	<p>ARARs/TBCs: No ARARs were identified for this site. For TBCs, Region IX PRGs for industrial soil (dated September 1995) were used as cleanup levels. For this review, updated residential and industrial PRGs (dated October 2002) were evaluated. Some PRGs changed due to new toxicity values and all PRGs were updated to incorporate more recent guidance regarding dermal exposure. These changes did not impact the outcome of the original comparison with cleanup levels.</p> <p>Land Use/Exposure Assumptions: This area is expected to remain commercial/industrial. It is noted, however, that concentrations of all detected constituents are below the Region IX PRGs for residential soil, with the exception of arsenic. Arsenic concentrations are below the background level for arsenic at the site.</p> <p>Toxicity Values: Changes in toxicity values were reflected in the PRGs for beryllium, chromium, cobalt, manganese, and thallium.</p> <p>RAOs/Cleanup Levels: The cleanup of T1 (OWS 10) met established cleanup levels. ICs are based on the condition that land use remain commercial/industrial. This site may no longer require ICs because concentrations of most detected constituents are below Region IX PRGs for residential soil. Although arsenic concentrations exceed residential and industrial PRGs, all concentrations were below background concentrations.</p>	<ul style="list-style-type: none"> • Statement of Basis/Final Decision, USAF, 1997 • Decision/Closure Document for No Further Action, Installation Restoration Program, Final, Jacobs, 1997

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IRP Site	Description/Basis	Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?	References
T2	Site T2 (or OWS 11) was remediated and confirmatory soil samples were collected. Cleanup levels were established using Region IX PRGs (dated September 1995) at a cancer risk of 1×10^{-6} and an HQ of 1.0. All concentrations from soil samples were below the Region IX PRG for industrial soil with the exception of arsenic. However, sample concentrations of arsenic were below the background concentration for arsenic.	<p>ARARs/TBCs: No ARARs were identified for this site. For TBCs, Region IX PRGs for industrial soil (dated September 1995) were used as cleanup levels. For this review, updated residential and industrial PRGs (dated October 2002) were evaluated. Some PRGs changed due to new toxicity values and all PRGs were updated to incorporate more recent guidance regarding dermal exposure. These changes did not impact the outcome of the original comparison with cleanup levels.</p> <p>Land Use/Exposure Assumptions: This area is expected to remain commercial/industrial. It is noted, however, that concentrations of all detected constituents are below the Region IX PRG for residential soil, with the exception of arsenic. Arsenic concentrations are below the background level for arsenic at the site.</p> <p>Toxicity Values: Changes in toxicity values were reflected in the PRGs for 2-methyl-naphthalene, beryllium, chromium, cobalt, manganese, and thallium.</p> <p>RAOs/Cleanup Levels: The cleanup of T2 (OWS 11) met established cleanup levels. ICs are based on the condition that land use remains industrial/commercial. This site may no longer require ICs because concentrations of most detected constituents are below Region IX PRGs for residential soil. Although arsenic concentrations exceed residential and industrial PRGs, all concentrations were below background concentrations.</p>	<ul style="list-style-type: none"> • Statement of Basis/Final Decision, USAF, 1997 • Decision/Closure Document for No Further Action, Installation Restoration Program, Final, Jacobs, 1997

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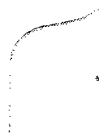
IRP Site	Description/Basis	Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?	References
T3	Site T3 (or OWS 9) was remediated and confirmatory soil samples were collected. Cleanup levels were established using Region IX PRGs (dated September 1995) at a cancer risk of 1×10^{-6} and an HQ of 1.0. All concentrations from soil samples were below the Region IX PRG for industrial soil with the exception of arsenic. However, sample concentrations of arsenic were below the background concentration for arsenic.	<p>ARARs/TBCs: No ARARs were identified for this site. For TBCs, Region IX PRGs for industrial soil (dated September 1995) were used as cleanup levels. For this review, updated residential and industrial PRGs (dated October 2002) were evaluated. Some PRGs changed due to new toxicity values and all PRGs were updated to incorporate more recent guidance regarding dermal exposure. These changes did not impact the outcome of the original comparison with cleanup levels.</p> <p>Land Use/Exposure Assumptions: This area is expected to remain commercial/industrial. It is noted, however, that concentrations of all detected constituents are below the Region IX PRG for residential soil, with the exception of arsenic. Arsenic concentrations are below the background level for arsenic at the site.</p> <p>Toxicity Values: Changes in toxicity values were reflected in the PRGs for beryllium, chromium, cobalt, manganese, and thallium.</p> <p>RAOs/Cleanup Levels: The cleanup of T2 (OWS 11) met established cleanup levels. ICs are based on the condition that land use remains commercial/industrial. This site may no longer require ICs because concentrations of most detected constituents are also below Region IX PRGs for residential soil. Although arsenic concentrations exceed residential and industrial PRGs, all concentrations were below background concentrations.</p>	<ul style="list-style-type: none"> • Statement of Basis/Final Decision, USAF, 1997 • Decision/Closure Document for No Further Action, Installation Restoration Program, Final, Jacobs, 1997

^a These sites were categorized as NFRAP with the condition that land use remains commercial/industrial.

ARAR = Applicable or Relevant and Appropriate Requirement
COPCs = Chemicals of Potential Concern
DAF = Dilution Attenuation Factor
HHRA = Human Health Risk Assessment
HQ = Hazard Quotient
ICs = Institutional Controls
IRPs = Installation Restoration Program
NFRAP = No Further Remedial Action Planned
OWS = Oil-Water Separator
PCB = Polychlorinated biphenyl
PRGs = Preliminary Remediation Goals

RAO = Remedial Action Objective
RBSC = Risk-Based Screening Criteria
RI = Remedial Investigation
SSLs = Soil Screening Levels
TBC = To Be Considered
TSCA = Toxic Substances Control Act
URSG = URS Greiner
USAF = U.S. Air Force
USEPA = U.S. Environmental Protection Agency
mg/kg = Milligrams Per Kilogram
 $\mu\text{g}/\text{cm}^2$ = Micrograms Per Square Centimeter

FIGURES



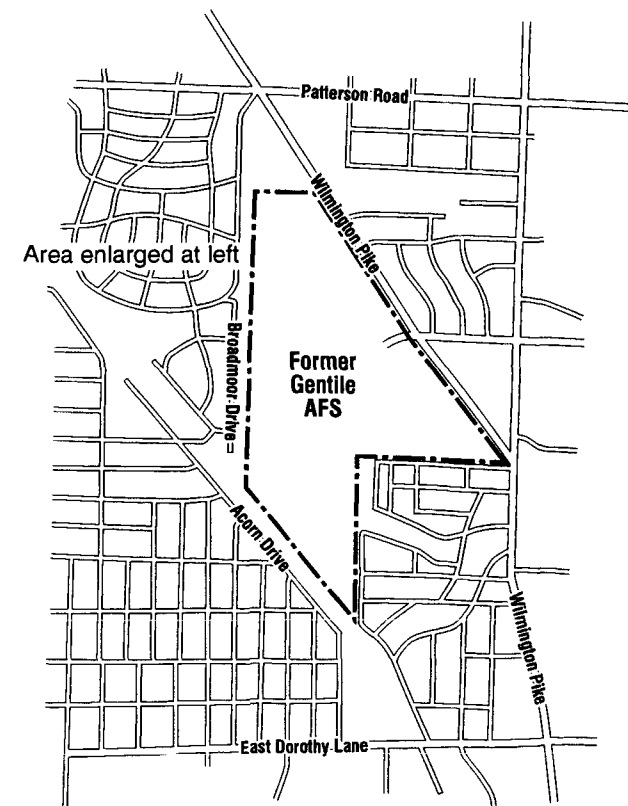
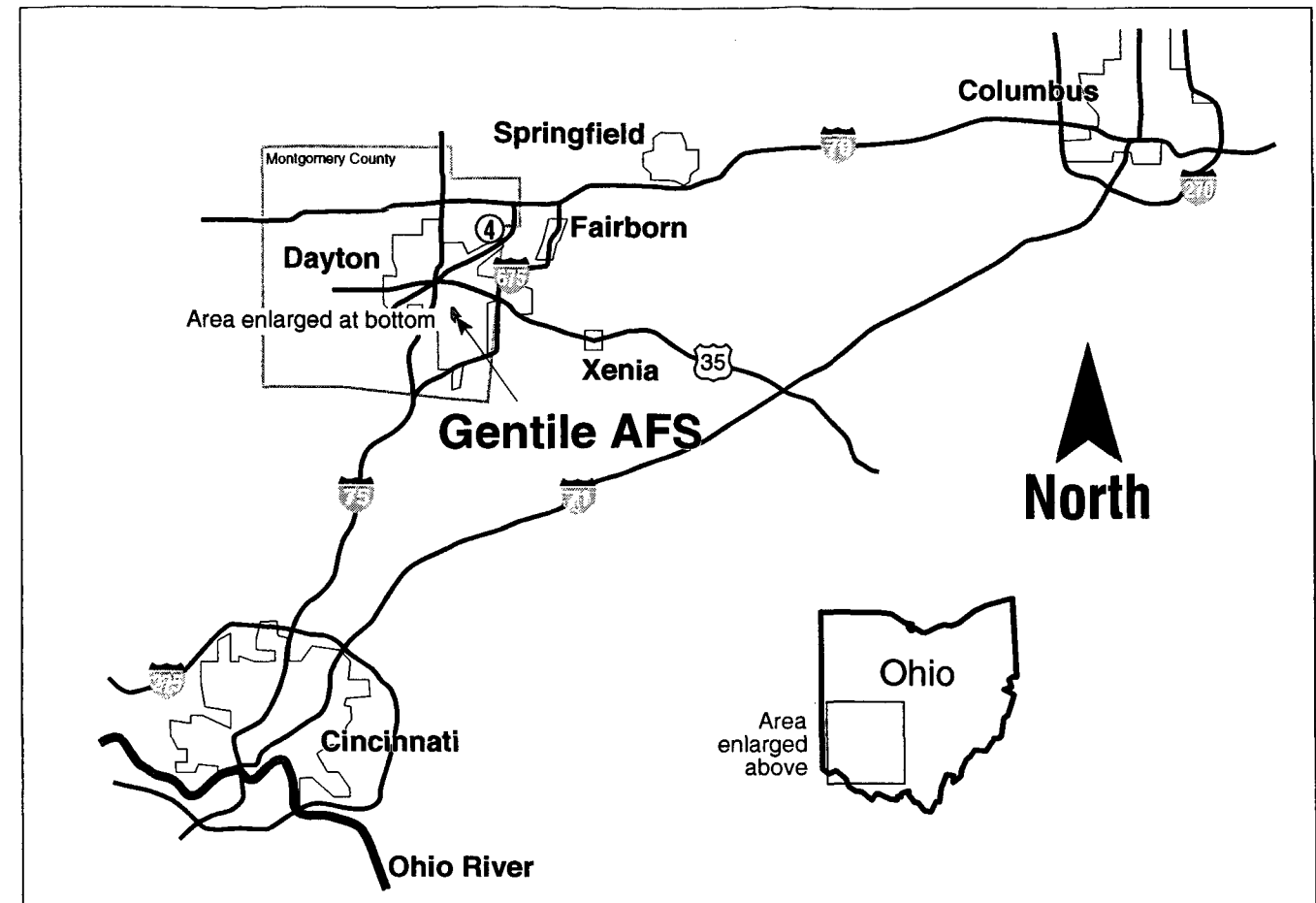
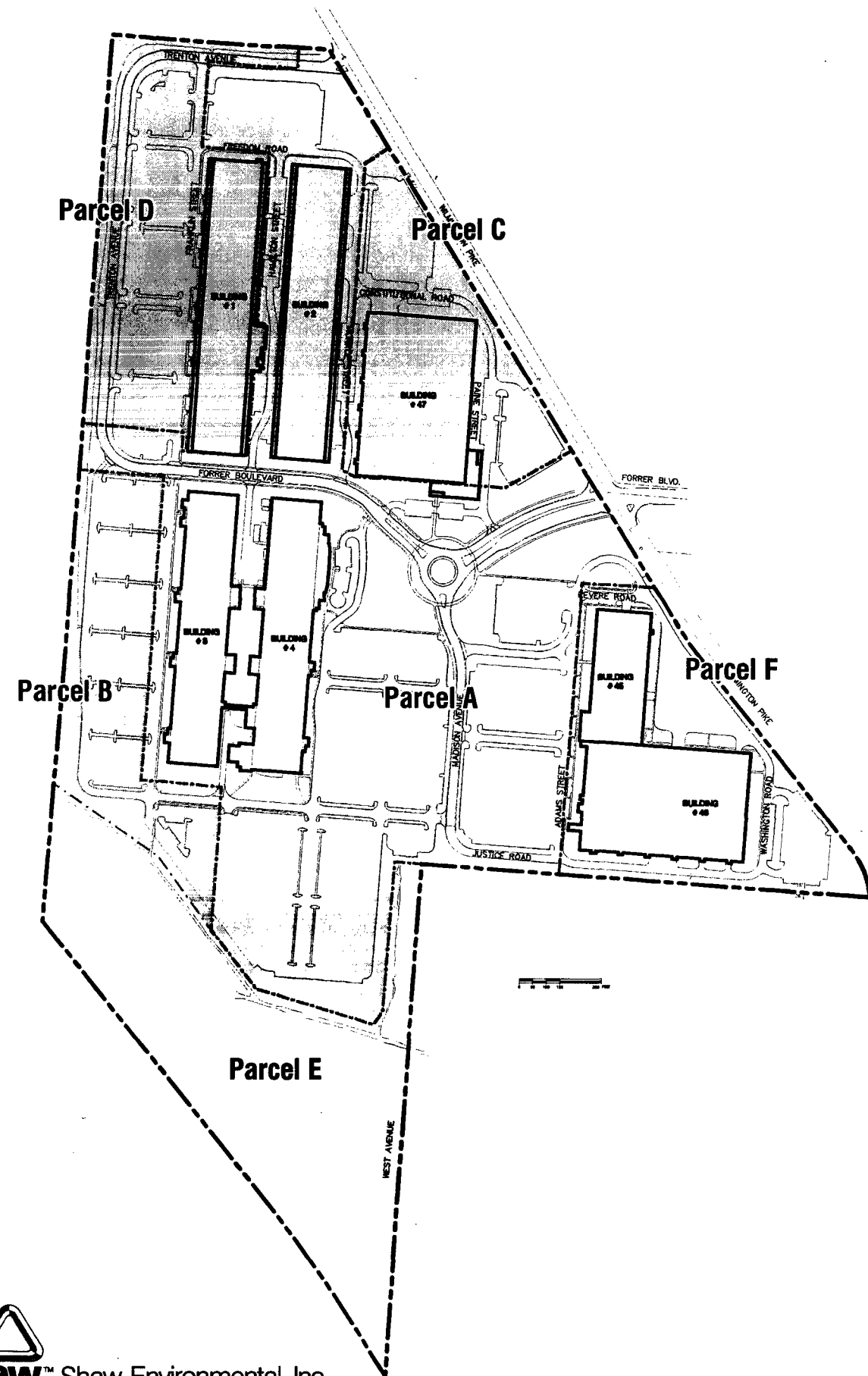
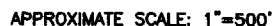


Figure 1.
Site Location Map and Parcel Locations.
Parcel E, Gentile AFS.



- - - - - BASE BOUNDARY
 - . - - - - - PARCEL BOUNDARY
 + + + + + APPROXIMATE LOCATION
 OF FORMER RR LINE

Site ID	Name	Parcel
C1	Little Beaver Creek, West Branch	E
C2	Rail Lines	E
C3	Small Arms Skeet Range	E
C4	Railroad Parcel	E
C5	Howiter Spill Site	E
C6	Former Water Tower	C
C7	Loop Storage Yard	E
C8	Southern Storage Area	E
D1	Disposal Area No. 1	E
D2	Disposal Area No. 2	B
D3	Disposal Area No. 3	E
D4	Disposal Area No. 4	E
D5	Electronic Tube Disposal Area	A
M1	Hydraulic Lift in Motor Pool	B
M2	Transformer Failure Area	A
M3	Waste Oil Feed Area	A
M4	Compressor Room	A
M5	Staining in Shop Area	A
M6	Floor Stains	A
M7	Base Civil Engineering Storage-B	B
O1	Paint Drain Line	A
O2	Oil/Water Separators	B
O3	Oil/Water Separator and Drain	A
O4	Oil/Water Separator	A
R1	Wash Rack Draining into Creek	B
R2	Floor Drain to Infiltration Pit	A
R3	Wash Rack	A
S1	Coal Storage Area-Building 17	B
S2	Reserve Coal Storage	E
S3	Pesticide Storage-Building 80	B
S4	Herbicide Storage	B
S5	PCB Storage Area	A
S6	Paint Storage Area	B
S7	Chemical Storage	A
S8	PCB Storage Area	A
S9	Instrument Calibration Area	F
T1	Hydrofluoric Acid Catch Basin	F
T2	Acid Neutralizing Tank	A
T3	Acid Neutralizing Sump	F

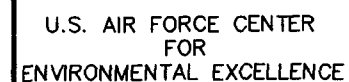
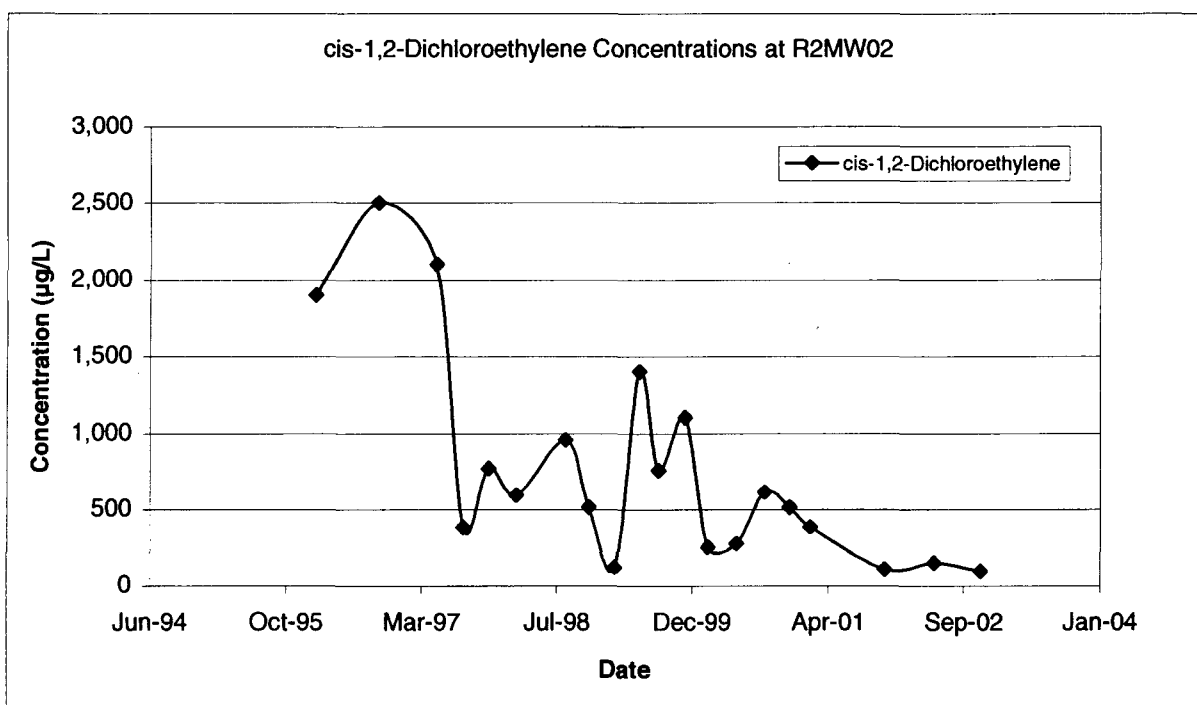
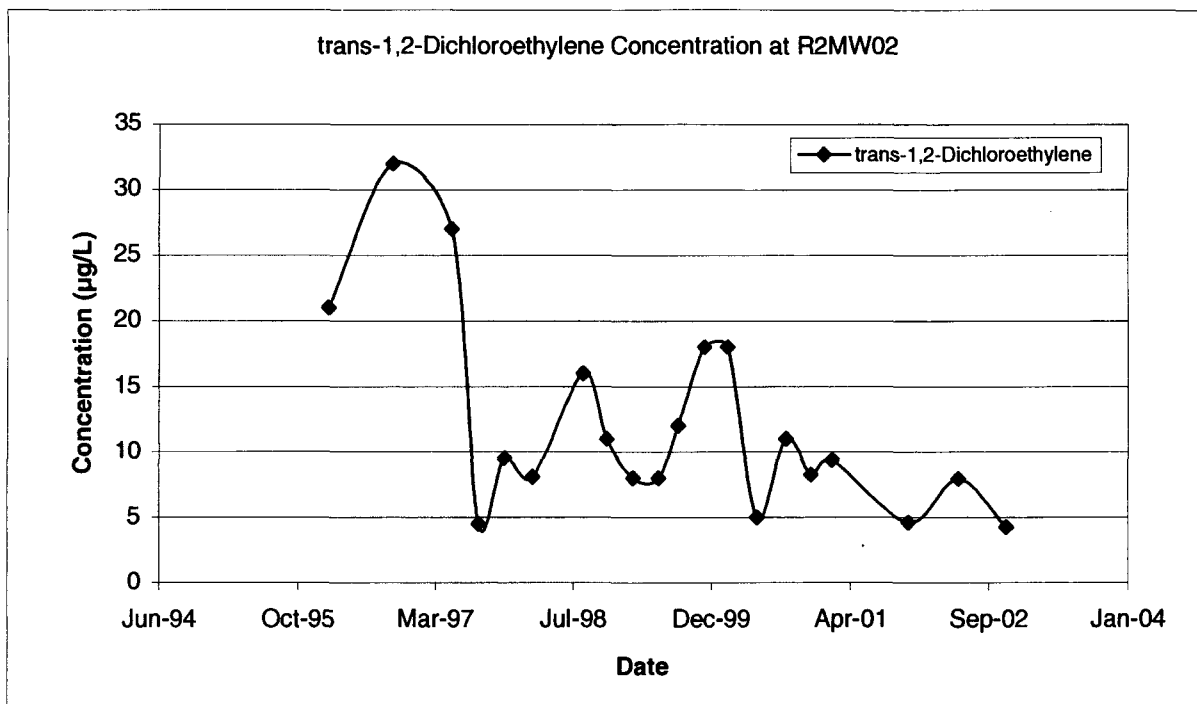


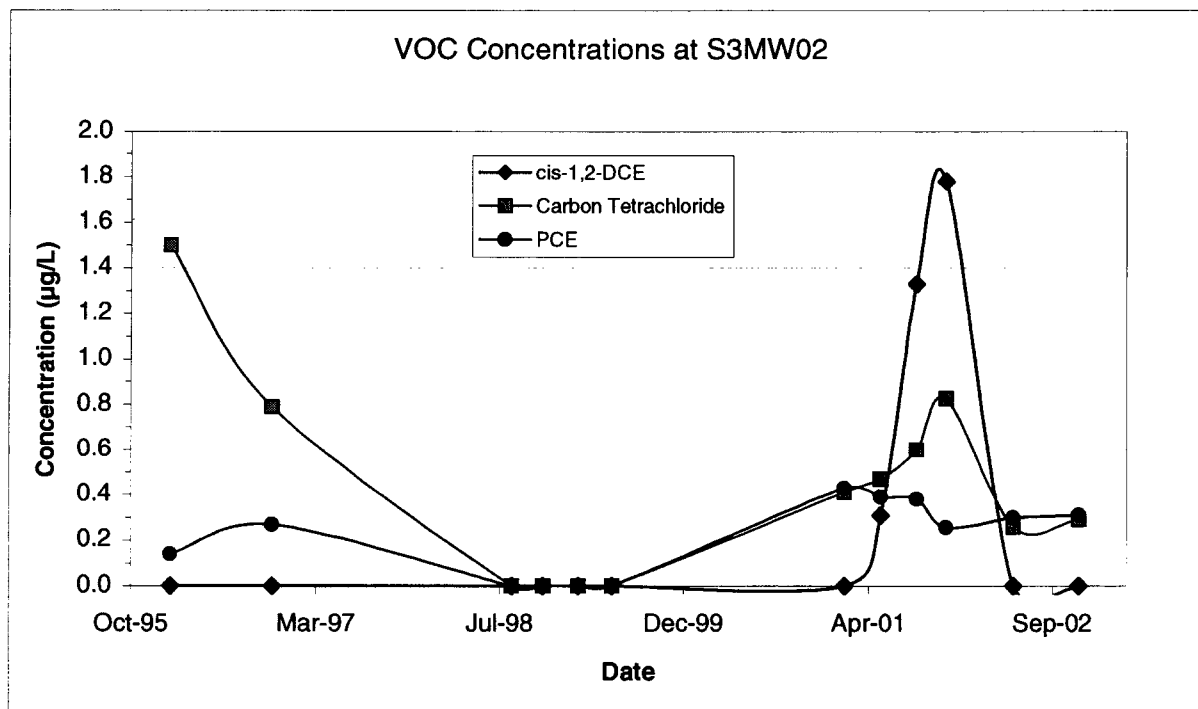
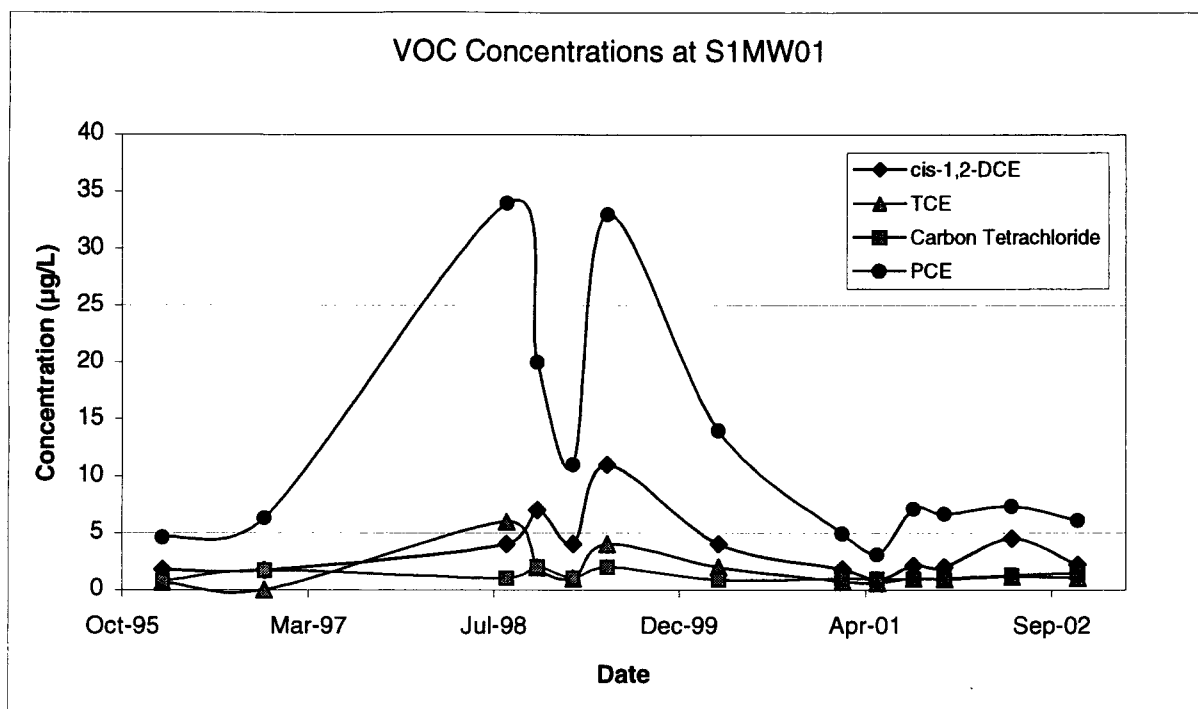
Figure 2
IRP LOCATION MAP
DEFENSE ELECTRONICS SUPPLY CENTER
GENTILE AFS, KETTERING, OH



DEFENSE ELECTRONICS
SUPPLY CENTER
GENTILE AFS, KETTERING OH

Figure 3
Cis- and trans-1,2-Dichloroethylene
In R2MW02
Site R2

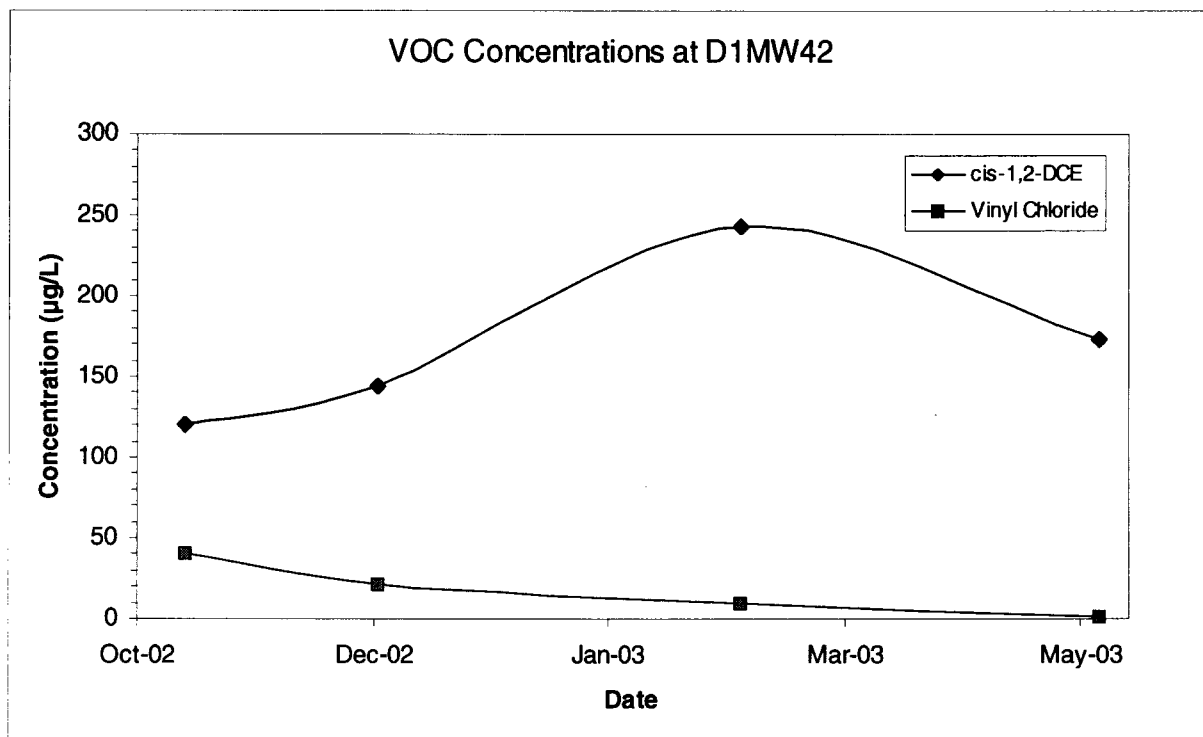
Shaw Environmental, Inc.



DEFENSE ELECTRONICS
SUPPLY CENTER
GENTILE AFS, KETTERING OH

Figure 4
Parcel B VOCs

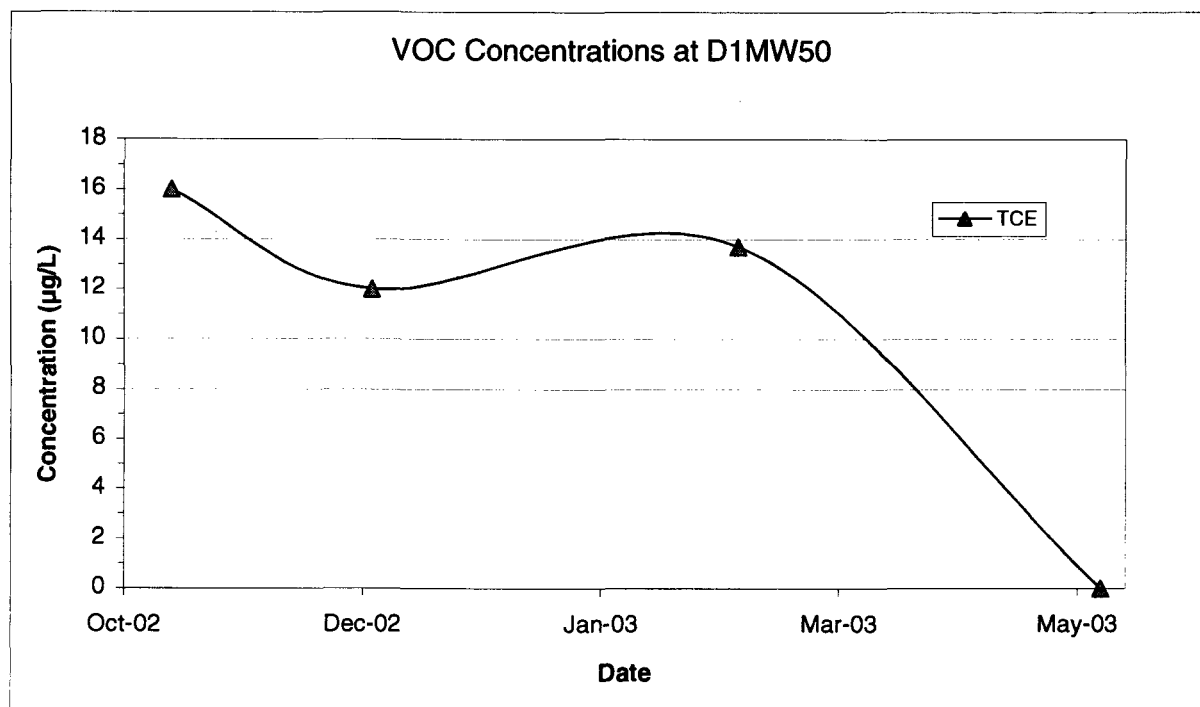
Shaw Environmental, Inc.



DEFENSE ELECTRONICS
SUPPLY CENTER
GENTILE AFS, KETTERING OH

Figure 5
Cis-1,2-Dichloroethylene and
Vinyl Chloride In D1MW42
Parcel E

Shaw Environmental, Inc.



DEFENSE ELECTRONICS
SUPPLY CENTER
GENTILE AFS, KETTERING OH

Figure 6
Trichloroethylene
In D1MW50
Parcel E

Shaw Environmental, Inc.